THE IRON TRADE REVIEW

Volume XLI | CLEVELAND, JULY 4 1907 | Number 1

NEW ORDERS LIGHT,

BUT MARKET SHOWS LITTLE WEAKNESS.

Bessemer Pig Sold for Fourth Quarter at Lower Price.—New Record in Ore Shipments.—Closing Mills for Repairs.

New business in pig iron and finished lines continues very light, but there is little, if any, indication of weakness. It is generally conceded that developments this month will probably not be important and that the period of inactivity may continue through August, but it is confidently expected that by Sept. 1 there will be a decided change. Sentimentally, the market seems to be somewhat stronger.

Pig Iron Is Quiet

In the east, the pig iron market is holding its strength with moderate buying of lower grade irons, particularly gray forge and rolling mill stocks. Basic specifications are good, but no new business is being done. Current foundry orders are for only limited tonnages. Labor conditions are unsettled at a number of eastern points, but so far this is not affecting the iron market. The Bessemer association has sold 1,500 tons of Bessemer pig iron for fourth quarter delivery at $23 valley furnace, the lowest price quoted since the heavy sales made at $21 in April for last half requirements. One interest announces the sale of 15,000 tons of gray forge for last half of this year at $22.50 furnace, and is figuring on 10,000 tons more. Southern iron is not quite so firm.

Iron Ore Shipments

Iron ore shipments for June amount to about 6,500,000 tons, by far the largest tonnage ever shipped in any previous month. The increase came almost entirely from the three ports at the head of the lakes, which shipped nearly 1,000,000 tons more than in June, 1906. The old ranges are falling behind in the record-making pace set by the Minnesota mines.

Many Mills Are Idle

The annual summer shut-down of mills will be short this month on account of the many orders on hand. One large interest closed its mills for repairs with three and one-half times as large a tonnage of specifications on hand at its Youngstown plants as at the same time last year.

Finished Material

Merchant and boiler tube business is extremely active, mills being far behind on their deliveries. In sheets and plates deliveries are improving, and on lighter gages of sheets the leading interest is now delivering in about eight weeks. Premiums on plates for prompt delivery are not being so frequently paid. New business in structural material was considerably smaller in June than in the previous month, but specifications have been heavy. Inquiries for several important new public buildings, including 10,000 tons for the new city hall at Chicago, and 3,000 tons for new court house at Cleveland, are expected to appear at an early date. The end of the strike of lake ship builders will hasten the placing of specifications for plates for new vessels. Steel car companies are estimating on several thousand new railway cars. The leading interest last week sold 35,000 tons of steel bars to an interest not agricultural, and the condition of both iron and steel bar markets is sound.

Coke and Old Material

Improvement in the coke market is reported at Pittsburg, but in other centers there is still a very limited demand. The scrap market is dull in nearly all centers and prices are sagging.

VERY HEAVY INCREASE

In Shipments from the Head of the Lakes for June.

Office of THE IRON TRADE REVIEW.
411 Providence Bldg.,
Duluth, July 2.

The predictions of record breaking shipments in June from the Minnesota mines have been borne out by compiled figures. This year 969,513 tons more were shipped from the three ports at the head of the lakes than in June, 1906. Of this increase the Missaba docks were responsible for 499,385 tons, or more than half and the Superior docks did over 37 per cent better than a year ago. The total shipment for the month was 4,677,139 tons. For next month the prospect is for a much bigger output as the remodeled dock No. 1 at Allouez was last week completed and the No. 5 dock at Two Harbors, which was rebuilt this spring, was put in service at 5 o'clock on Friday last. These two docks should make new records for themselves in July.

The shipments by docks during the month were as follows: Duluth, 2,156,216 tons as compared with 1,656,831 tons in June, 1906; Two Harbors, 1,303,195 tons against 1,165,207 tons a year ago, and Superior, 1,217,728 tons against 885,588 tons. From the Marquette range the shipments give promise of being less than last year particularly through Marquette, while the Menominee range will do close to a quarter of a million tons better.

At Two Harbors the new No. 6 dock soon to be built will inaugurate the use of steel in the construction of the superstructure and concrete for the abutments. The superstructure will be built of I-beam angles and channels, but the pockets will be lined with wood. The footings for the steel uprights will be of concrete resting on the usual cribbing. The new dock will be located west of No. 5, will be 940 feet long and contain 142 pockets. It will not be ready for service this season.

From present indications it seems more than probable that a number of mines operated by independent interests will fall short of their season's schedule by no small margin. Particularly is this true of most of the new shafts put down this year and there is reason to believe that some buyers of ore will come into the market in October or even earlier to fill out 1907 requirements.

THE WEEK IN IRON CENTERS

PITTSBURG.

New Business Light, but Specifications Very Heavy—Busy Mills Closed for Repairs.

Office of THE IRON TRADE REVIEW,
521 Park Bldg., July 3.

The second half of the year starts out with trade conditions good in practically every branch of the business. It is true that the very heavy pressure of the first part of the year has been released to a great extent and new business at the present time is slow, but, as has been stated in these columns a few weeks ago, it is slow only by comparison with a heavy pressure period.

In nearly every branch, manufacturers of finished material are hopelessly oversold, and to them the slackening of pace in the volume of new business is a welcome relief. The pressure for deliveries is as great as it has been at any time during the first part of the year, and no previous instance can be recalled where, during periods of apparent inactivity as far as new buying is concerned, there has been such an urgent demand for shipments on existing obligations, or where, during such a time there have been so few suspensions or cancellations. Cancellations are not heard of at this time, and, should a few be made, there would be no feeling of apprehension, as the material could readily be diverted to other directions.

The annual summer shut-down period is at hand. Mills that have been running to capacity since last fall are about to make repairs and overhaul plants, but this will last only a week or ten days in most instances, and not more than a month where extensive alterations are to be made. The case of the Republic Iron & Steel Co. may be cited as an instance of existing conditions. The Youngstown plants of the company, with the exception of the blast furnaces and Bessemer converters, shut down last Saturday night for repairs. The company shut down with three and one-half times as many unmanufactured specifications on finished products as at the same time last year. On bar iron its June specifications were 2,000 tons more than May.

The merchant pipe and boiler tube business never was so active as it is at the present time. Sheet products, with the exception of tin plate, which is light as far as current specifications are concerned, are in strong demand. The slow tin plate specifications are attributed to the crop reports, but with the prevalent warm weather conditions are better and during the past week an improvement has been noted.

The scarcity and high prices of semi-finished material have made it unprofitable for a few of the independent manufacturers to compete and the difficulties of three large eastern manufacturers are expected to rebound to the benefit of Pittsburg interests which have their own supply of raw and semi-finished material, and this is particularly true of structural shapes and plates. The fact that the Cambria Steel Co. has found it more profitable to sell steel billets than to roll shapes and plates is an indication of this condition. This steel has been absorbed without causing a ripple or breaking a price.

The rail situation is quiet and is expected to continue so for some little time, or until the railroads and rail manufacturers get together and agree upon the 1908 specifications. There has been no serious disagreement between the Pennsylvania railroad and the Steel Corporation. The situation stands as it did nearly two months ago when the railroad asked that the Steel Corporation crop off 25 per cent from the top of its rail ingots before rolling them into rails. With this condition imposed, the steel company advanced its price $5 per ton, or from $28 to $33 per ton, and nothing has been done since that time.

Pig Iron.—The Bessemer Association during the past week sold 1,500 tons of Bessemer pig iron for fourth quarter delivery at $23 valley furnace. This is the lowest price quoted since the heavy last half sales were made at $21 in April when the Youngstown Sheet & Tube Co. closed for its last half requirements. Spot pig iron prices have shrunken very materially during the past two weeks, and Bessemer for prompt shipment is quoted from $23 to $23.25 at the furnace, or practically the same as last half iron. There is still a little Bessemer iron in the valleys at these figures, but it is doubtful whether any large tonnages could be secured. The feeling is pretty general that spot prices have been too high for healthy business. Northern No. 2 foundry iron is quoted $23.50 to $24 valley for prompt and last half. The inquiry has been light and for small tonnages. Furnaces are making better deliveries and this has been the greatest factor in bringing down the price of spot iron. As far as can be learned there is no inquiry out for 1908 foundry iron, neither is there any interest shown in Bessemer or basic, although several large tonnages of malleable Bessemer have been sold for next year deliveries.

In sounding out producers of steel making iron as to their ideas of next year's opening prices the impression prevails that $21.50 to $22 will be the market on Bessemer. The Corrigan-McKinney interests announce the sale of 15,000 tons of gray forge, or mill iron, for last half of this year at $22.50 furnace, with a low freight rate into the Pittsburg district. Southern No. 2 is being quoted $18.50 Birmingham for first half or first quarter of next year, and a little prompt iron has been sold at $21.50 Birmingham.

The strike of blast furnace workers in the Mahoning and Shenango valleys failed to materialize on July 1, as the men had no backing and nothing to sustain a strike. There was a little difficulty at Struthers furnace, but it did not interfere with the work and no strike resulted. On last half deliveries we quote as follows:

Bessemer, Valley	$23.00 to 23.25
Bessemer, Pittsburg	23.90 to 24.15
No. 1 Foundry, Pittsburg	24.90 to 25.40
No. 2 Foundry, Pittsburg	23.90 to 24.40
Gray Forge, Pittsburg	23.40 to 23.90
Basic, Valley	23.00 to 23.25
Basic, Pittsburg	23.40 to 24.15

Ferro-Manganese.—The inquiry for ferro-manganese and ferro-silicon during the past week has been lighter than it was the week before, and with the small volume of business done prices have been sentimentally weaker, although not enough actual tonnage was placed to materially affect prices one way or the other. For prompt shipment, ferro-manganese, foreign 80 per cent, is quoted $63 to $64 delivered Pittsburg, and for last half shipment $62 to $63.

Imported 50 per cent ferro-silicon is quoted $109 to $110 Pittsburg, domestic 12 per cent, $36; 11 per cent, $35; 10 per cent, $34. The lower grades of imported ferro-silicon are quoted $1 lower. These quotations are applicable to Pittsburg territory. Western and central western prices, where the material is not subject to the competition of foreign grades, are higher and in the east a little lower.

Plates.—The American Ship Building Co. to date has placed contracts

for material for four lake steamers, and the Great Lakes Engineering Co., of Detroit, has placed 10,000 tons plates and shapes for three steamers, and inquiry is out for material to cover the construction of two more boats. Due to the congested condition of mills and the heavy specifications against existing obligations, the big plate makers can not touch the small miscellaneous business that is being offered, and are not even quoting upon it. One feature of the plate business is that the mills cannot get the necessary plates to go with their ordinary structural business. The steel car companies are figuring on several thousand new steel cars for railroads, and it is expected these will be closed during the current week. We quote as follows:

Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.80c to 1.90c f. o. b. mill Pittsburg for prompt shipment, and 1.70c base Pittsburg on future deliveries. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c. A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than four inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1.00c. Gages under ¼-inch to and including 3-16-inch plate on thin edges, 0.10c; under 3-16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—The past week has seen considerable new business placed for corrugated roofing sheets and more than usual activity in iron sheets, but taken as a whole there has been nothing out of the ordinary. Specifications on black, galvanized, and blue annealed sheets have been good and mills are catching up on their deliveries more rapidly than was expected a month ago. There has been no change in prices and we quote:

Black steel sheets one pass, cold rolled, Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 29, 2.75c; No. 30, 2.85c; galvanized, Nos. 10-11, 2.65c; Nos. 12-14, 2.75c; Nos 15-16, 2.85c; Nos. 17-21, 3.00c; Nos. 22-24, 3.15c; Nos. 25-26, 3.35c; No. 27, 3.55c; No. 28, 3.75c; No. 29, 4.00c; No. 30, 4.25c; blue annealed, No. 10 and heavier, 1.85c; Nos. 11-12, 1.90c; Nos. 13-14, 1.95c; Nos. 15-16, 2.05c. Corrugated roofing, $1.90 per square for No. 28 painted, 2½-inch corrugation, and galvanized, $3.25 per square for No. 28.

Tin Plate.—New business has been light and specifications slow although an improvement in specifications is noted and attributed to a more optimistic view on the part of canning interests on account of more favorable crop reports due to the continued warm weather. We quote:

Coke tin plate 100-pound basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less 2 per cent for cash in ten days.

Rails and Track Material—In the absence of anything definite regarding the intentions of the leading railroad interests as to their 1908 specifications and in view of their silence since the $33 price was quoted by the Carnegie Steel Co., on the Pennsylvania specifications, there has been very little done in standard sections. The feature of the week in light rails has been the sale of 5,000 tons of light rails for export to Japan to be used in connection with the development of large sugar interests. Prices are unchanged and we continue to quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $40; 12-pound, $36 to $37; 16-pound, $35 to $36; 20-pound, $34 to $35; 25 to 45-pound, $33 to $34; angle splice bars for standard sections, $1.65; standard spikes for forward deliveries, $2.30 to $2.35 Pittsburg; hand spikes, $2.50 Pittsburg.

Hoops, Bands and Cotton Ties.—Several of the large consumers, particularly the cooperage interests, have already closed contracts for their requirements for the year beginning July 1, but the big volume of business is not expected in for a month or six weeks from this time. Specifications against contracts are very heavy and mills are running to capacity in order to make the necessary shipments. We quote as follows:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c, base half extras as per standard steel. Cotton ties, 96c per bundle.

Steel.—The Lackawanna Steel Co. and the Cambria Steel Co. are still offering billets in the open market. The Steel Corporation has purchased the largest part of this semi-finished material, which has been offered during the past month and stands ready to take more if it is offered at the same prices. Soft Bessemer billets 4 x 4 and larger are quoted $30 mill and sheet bars for third quarter $32; forging billets are quoted $35 to $36 mill. A small tonnage of open-hearth billets during the past week was sold at $30.50 Pittsburg.

Merchant Bars.—The July production of both iron and steel bars will be materially less than the heavy tonnages that have been turned out by all mills for several consecutive months past. This is due to the annual shut down for repairs. The Republic Iron & Steel Co. shut down its entire Youngstown plant with the exception of the blast furnaces and Bessemer converters on Saturday of last week and the converters were shut down Wednesday night of this week. The mills of this plant will be down about two weeks if the necessary repairs and overhaul can be made in this time. The leading interest during the past week sold to one buyer 35,000 tons of steel bars to an interest outside of the agricultural implement manufacturers. This latter interest has practically closed up its business for the year and from now on the buying by this particular trade will be light. The market on steel bars is exceedingly strong without the slightest sign of weakness. Bar iron has been moving fairly well and prices are firm at 1.75c to 1.80c for Pittsburg deliveries and 1.60c base Pittsburg plus freight to point of delivery for western shipment. We quote as follows:

Common iron bars, 1.75c to 1.80c Pittsburg in carload lots and over 1.80c to 1.85c in less than carloads; Bessemer steel bars, 1.60c, net for future deliveries; 1.85c to 1.90c out of stock; plow and cultivator, 1.60c, net; channels, angles, zees, tees, under three inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30 advance. Cold rolled and ground shafting, 50 per cent off in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. The price of planished and machine straightened tire is 1.80c, base, half tire extras. Iron finished tire up to 1½ inch and over to be sold on regular bar basis of 1.60c base, half extras, steel card.

Structural Material.—The shut down or at least temporary suspension of the Eastern Steel Co., Passaic Co., and Milliken Bros., has resulted in

backing up a large tonnage of structural material into the Pittsburg territory that under ordinary circumstances would have been placed with these eastern mills. Notwithstanding the large capacities of local structural mills, nothing like prompt delivery can be given on structural material, particularly in the heavy shapes. The volume of new inquiry being received by construction companies is fairly large in the aggregate, but individual inquiries are small and of such a nature that the larger companies do not consider it desirable business. The smaller construction companies are snapping up these little tonnages very aggressively and at sharply competitive prices. The conditions of books of manufacturers do not reflect reports that building business is being held up or delayed. We quote:

Beams and channels, 15-inch, and under, 1.70c; over 15 inches, 1.80c; zees, 1.70c; tees 1.70c; angles from three to six inches inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.80c base.

Wire and Wire Nails.—While the actual tonnage by monthly comparison has fallen off to a material extend during the past few weeks, the tonnage compared with some months in 1906 and previous years is so much larger and the demand so much heavier that instead of the usual shading in order to secure business at this time of the year the reverse is liable to happen within a short time. Prices are very firm and we quote as follows:

Wire nails, jobbers' carload lots, $2; retailers' carload lots, $2.05; less than carloads, $2.10; painted barb wire, $2.15, for jobbers in carloads; retailers in carloads, $2.20; and less than carload, $2.30, with 30c for galvanizing; plain wire, $1.85 for jobbers, and $1.90 by carload.

Merchant Pipe. — Notwithstanding the fact that no delivery promises are being made by either the leading interest or independent manufacturers on new business being currently placed with them, the tonnage being booked has in no way decreased and, if anything, is larger than during the first half of the year. At the present time there is inquiry out for five miles of six inch line pipe, four miles of eight inch line pipe and ten miles of eight inch casing and scattered inquiries which would aggregate ten or fifteen miles of small full weight iron pipe together with a very heavy tonnage of miscellaneous business. We quote the following consumers' discounts subject to one point and five to jobbers in large lots:

	—Steel— Black.	Galv.
⅛ and ¼ inch	65	49
⅜ inch	67	53
½ inch	69	57
¾ to 6 inches	73	63
7 to 12 inches	70	55
EXTRA STRONG PLAIN ENDS.		
⅛ to ⅜ inch	58	46
½ to 4 inches	65	53
4½ to 8 inches	61	49
DOUBLE EXTRA STRONG PLAIN ENDS.		
½ to 8 inches	54	43

Iron Pipe.—Conditions regarding iron pipe are unchanged. The demand is enormous and manufacturers are making very indefinite delivery promises. We quote the following discounts, to consumers, subject to one point:

RANDOM LENGTHS WITH THREADS AND COUPLINGS—CARLOAD LOTS.	Black.	Galv.
⅛, ¼ and ⅜ inch	59	43
½ inch	62	51
¾ and 6 inch	67	57
7 and 8 inch	62	46
PLUGGED AND REAMED.		
1 to 4 inch	65	55
EXTRA STRONG PLAIN ENDS.		
⅛, ¼ and ⅜ inch	52	40
½ to 4 inch, inc	59	47
4½ to 8 inch	55	42
DOUBLE EXTRA HEAVY PLAIN ENDS.		
½ to 3 inch, inc	48	37

Boiler Tubes.—The beginning of the second half of the year finds manufacturers of boiler tubes "chock-a-block" with business already on the books and more definite specifications will be demanded from consumers. Railroads and locomotive builders are holding up their last half contracts to some extent on account of delivery requirements but it is anticipated they will all be covered before the end of the month. We quote:

	Iron.	Steel.
1 to 1½ inch	42	47
1¾ to 2¼ inch	42	59
2½ inch	47	61
2¾ to 5 inch	52	65
6 to 13 inch	42	59

2¼ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Coke.—The coke market took a very decided brace during the past week and spot furnace coke is now quoted $2.35 to $2.50, and for last half, depending upon the grade, $2.50 to $2.60. The demand for spot coke has been unusually heavy and this increased demand, together with the higher prices, is due to practically all furnaces taking on extra coke on account of the holiday. The situation is stronger than it has been for several weeks past. Many plants in the region have asked their employees to work on Thursday in order to maintain the supply, as the production for the week will probably show a very heavy decrease on account of labor not returning to work the latter part of the week. There is a fair demand for both spot and last half foundry coke, and for spot deliveries we quote $3 to $3.15 to the consumer, and on last half, according to the brand, $3.15 to $3.30 at the oven.

Old Material.—The scrap market is very quiet and dealers are finding it harder to sell material than has been the case for some time past. There is no real change in prices, but the sentiment is weaker and with the quiet shading going on, it is expected that next week will find the market considerably lower. Cast scrap and borings are the only strong features in the market, the remaining factors being dull. For delivery in the Pittsburg district gross tons we quote as follows:

Heavy melting scrap, $18.25 to $18.75; re-rolling rails, $18.50 to $19; bundled sheet scrap, $16 to $16.50; iron axles, $31 to $31.50; old iron rails, $22.50 to $23; No. 1 wrought scrap, $18.50 to $18.75; old car wheels, $24 to $24.50; low phosphorus scrap, $23 to $23.50; machine shop turnings, $15.25 to $15.75; axle turnings, $15.75 to $16; cast borings, $13.50 to $14; No. 1 cast scrap, $21 to $21.50.

CHICAGO.

Improved Delivery of Finished Lines. —Pig Iron Market Very Dull.

Office of THE IRON TRADE REVIEW,
1362 Monadnock Block, July 2.

The second half of the year opens inauspiciously. New commitments are light to the point of stagnation. Specifications, however, are good, and the volume of these upsets the tradition of midsummer dullness. Mills and furnaces are continually pressed for shipments of pig iron, pipe, steel bars, plates, wire products and agricultural shapes, and in many instances requests have been made that deliveries be anticipated. Manufacturers for the agricultural trade are the heaviest consumers in proportion to their requirements, a surprising fact in view of the adverse crop reports current so long, and that midsummer is their dull manufacturing season. Excepting in tubular goods, which are still four to five months behind, delinquent deliveries are being rapidly overtaken. Premium business has entirely disappeared in finished lines, and is rapidly vanishing from the pig iron market. Reasonably prompt shipment can now be secured on plates, sheets, structural shapes and wire products at schedule prices, a condition in striking contrast to that prevailing a few months ago when the best delivery obtainable on either product was four to six months. Scrap has improved slightly in tone and value, but trading is light.

Pig Iron.—The general tone of the market is lower, due to the light demand and a corresponding dullness in

finished materials. The calls for spot iron have been a little more frequent than a week ago, but interest in forward deliveries is nil. Prices have not appreciably changed from those ruling a week ago, but the market is slightly more plastic as a result of the many cross-currents and wavering confidence. Southern spot No. 2 has sold as low as $21.50 Birmingham, and northern No. 2 foundry at $25.50 Chicago, but these are isolated transactions and are surrounded with special conditions. More representative quotations for spot iron are $22 Birmingham for southern No. 2 and $26.00 Chicago for northern No. 2. For the entire second half, northern grades can be purchased on the basis of $25 Chicago for No. 2, and southern iron at $21.50 Birmingham for the third quarter, and $20 for the fourth quarter; and on such business deliveries will be commenced right away. The consumption of metal is undiminished, a fact which constitutes the strongest feature of the market. Not only are foundrymen taking all the iron shipped, but in many instances are requesting that deliveries be anticipated, a condition that seems a sure preventative to sharp recessions.

The maximum quotations below are for the third quarter; the minimum for the fourth quarter:

Lake Superior Charcoal	$27.00 to 27.50
Northern Foundry No. 1	25.50
Northern Foundry No. 2	25.00
Northern Foundry No. 3	24.50
Northern Scotch Foundry	25.50
Southern Foundry No. 1	24.85 to 26.35
Southern Foundry No. 2	24.35 to 25.85
Southern Foundry No. 3	23.85 to 25.35
Southern Foundry No. 4	23.35 to 24.85
Southern No. 1 Soft	24.85 to 26.35
Southern No. 2 Soft	24.35 to 25.85
Southern Gray Forge	22.85 to 24.35
Southern Mottled	22.60 to 24.15
Southern Silveries, 4 per cent to 6 per cent Silicon	27.85 to 28.85
Jackson Co. Silveries, 6 per cent	29.40 to 29.90
Jackson Co. Silveries, 8 per cent	30.40 to 30.90
Jackson Co. Silveries, 10 per cent	31.40 to 31.90
Malleable Bessemer	25.00

Billets and Rods.—No features of interest have developed in the past week. Some trades in wire rods have been made at around $37 Pittsburg, and in forging billets at $38 Chicago. Large tonnages, however, can shade these prices. Rerolling billets are offered at $31 Pittsburg. Deliveries on billets can be started at once by several mills.

Merchant Bars.—Implement makers show no disposition to curtail their specifications, despite the fact that this is their dull manufacturing season, and full shipments are going forth on nearly every contract. New tonnage also is active, one mill receiving considerably over 10,000 tons in one mail. On special shapes there is also a good business. Bar iron is without change in price, but tonnage is light. The Interstate Iron & Steel Co. has closed its East Chicago mill for a week to make repairs. We quote carload lots, Chicago delivery, as follows:

Bar iron, 1.78c to 1.83c; soft steel bars and bands, 1.78c half extras; soft steel angles, less than 3 x 3, 1.88c; hoops, 2.18c base, full extras; planished or smooth finished tire steel, 1.98c; iron finish, up to 1½ x ½ inch, 1.93c base; iron finish, 1½ x 1½ inch and larger, 1.78c base; channels for solid rubber tire ¾ to 1 inch, 2.28c, and 1⅛ inch and larger, 2.18c; smooth finished machinery steel, 2.18c; flat sleigh shoe, 1.83c; concave and convex sleigh shoe, 2.08c; cutter shoe, 2.36½c; toe calk steel, 2.33c; railway spring, 1.98c; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are irregular, though the official prices are without change at 50 per cent off in car lots, and 45 per cent in less than carload lots, base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 2.25c full extras; soft steel rounds, and square, 3-inch and larger, $2 per 100 lbs. base; flats, 2 inches to 4 inches by ⅛ inch and larger, $2 per 100 pounds base; 4½ inches by 5 inches and 6 inches by 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $2 half extras; soft steel hoops, $2.50 full extras. Other sizes not mentioned above, $2 per 100 pounds base plus half extras.

Plates.—Mills are rapidly getting into good shape on the delivery question. Prompt shipments can now be secured without the payment of premiums, a number of independent mills offering this delivery on desirable business. Specifications are without appreciable decline, but new tonnage is light. Prices are without change as follows:

Plates, ¼ inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.70c to 2c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago, 18c per 100 pounds for carload lots, and 20c per 100 pounds for less than carload lots. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼ inch and heavier up to 72 inches wide, 2.20c; 3-16 inch up to and including 60 inches wide, 2.30c; 3-16 inch, 72 inches wide, 2.55c; No. 8 up to 60 inches wide, 2.50c. Flange steel, 25c extra; heads, 25c extra.

Sheets.—The decline in new tonnage is best evidenced by the fact that a few months ago it was impossible to secure delivery from the leading interest on either black or galvanized sheets short of 18 to 24 weeks. Today deliveries on both materials can be made within four to six weeks. The operation of mills has been at record-breaking pace for some weeks past, and new business has not equalized the output. Premiums have disappeared entirely from the market. Regular prices, however, have not weakened. We quote as follows:

Black sheets, Nos. 8, 9, and 10, 1.90c Pittsburg; No. 28, 2.60c Pittsburg. Galvanized sheets, No. 28, 3.75c Pittsburg. Freight to Chicago, 18c per 100 pounds for carload lots, and 20c for less than carload lots. Jobbers' prices on carload lots and less from store are as follows:

No. 10, 2.50c to 2.55c; No. 12, 2.55c to 2.60c; No. 14, 2.60c to 2.65c; No. 16, 2.70c to 2.80c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3c; No. 27, 2.95c to 3.05c; No. 28, 3.05c to 3.15c; No. 30, 3.35c to 3.45c. Galvanized sheets, No. 10 to 20, 3.50c to 3.55c; Nos. 22 and 24, 3.65c to 3.75c; No. 26, 3.85c to 3.90c; No. 27, 4.05c to 4.15c; No. 28, 4.25c to 4.35c; No. 30, 5.40c to 5.45c.

Structural Steel.—Specifications on mills are in better volume than for two weeks past. Fabricators state, however, that contracts for buildings are slow in closing as a general thing. The promptness with which mills can commence shipments bears out this statement, deliveries being offered within a few days after receipt of order. It is expected that plans for the new city hall will be in shape for figuring within a few weeks. The steel requirements for this structure are estimated at 10,000 to 11,000 tons. Dismantling will be commenced on the present building this month. No contracts of moment have been closed in the past week, though a very large tonnage is pending. We quote prices as follows:

Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from Pittsburg to Chicago, 18c per 100 pounds for carload lots, and 20c per 100 pounds for less than carload lots. Quotations from store are as follows:

All angles, three inches and larger, including six inches, $2.10 per 100 pounds; angles, over six inches, $2.15 per 100 pounds base; beams, 3 to 15 inches inclusive, $2.10 per 100 pounds base; channels, three inches and larger, $2.10 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—The only rail contract reported is for

2,500 tons, and this was placed with the Carnegie Steel Co. Contracting for track supplies for 1908 delivery has not yet commenced, though a number of railroads have intimated about the extent of their requirements. Light rails continue in brisk demand, the local mill having three or four months' business on its books. Quotations are as follows:

Bessemer rails, $28 to $30; less than 500-ton lots, $32; open-hearth rails, $29; light rails, Bessemer, 30 to 45-pound sections, $35; 25-pound, $36; 20-pound, $37; 16-pound, $38; 12-pound, $39, and lighter sections down to 8-pound, $45.50, all f. o. b. mill. Track supplies vary in price according to quantity and delivery. On orders accompanying rail contracts for future delivery, we quote: Angle bars, 1.65c; spikes, 2.35c; bolts with square nuts, 2.65c; with hexagon nuts, 2.80c. For carload lots or less, for prompt shipment, the following prices are asked: Angle bars, 2.25c to 2.75c; spikes, 2.60c to 2.70c; bolts with square nuts, 2.85c; with hexagon nuts, 3c.

Cast Iron Pipe.—A contract for 1,400 tons of pipe has been let to the leading producer by the city of Cleveland. Medina, O., also has closed with the same concern for 500 tons. The only large order pending is that of Columbus, O., for 2,500 tons, which will be let July 10. Routine business continues good. Prices are without change, as follows: Four-inch water pipe, $38.60; 6 to 12-inch inclusive, $37.60; gas pipe, $1.00 a ton higher.

Merchant Pipe and Boiler Tubes.—On the smaller sizes of black steel pipe, mills are from three to five months behind, with little probability of overtaking same before winter sets in. New tonnage for pipe and tubes is coming in very freely, and specifications against old contracts are also to full requirements. Prices are firmly maintained. We quote mill discounts, carload lots, Chicago delivery, as follows: On steel pipe, jobbers are allowed a concession of one point and 5 per cent additional from the schedule in force.

MERCHANT PIPE.

	—Steel— Black.	Galv.
¼ to 6 inches, inclusive.....	71.2	61.2
BOILER TUBES.		
	Steel.	Iron.
2¼ to 5 inches, inclusive.....	62.2	49.2

Mill quotations on iron pipe are from four to five points higher than above. A concession of one point from the following quotations, is allowed by Chicago jobbers on orders for shipment from local warehouse stocks. We quote for less than carload lots as follows:

MERCHANT PIPE.

	Black.	Galv.
⅛ to ¼ inch.....	60	44
⅜ inch	62	48
½ inch	64	52
¾ to 6 inches.....	68	58
7 to 12 inches.....	64	49

Minimum prices for wrought iron pipe, carload lots or greater, from Chicago stocks, are as follows: ⅛ inch to ¼ inch, 55; ⅜ inch, 57; ½ inch, 59; ¾ inch to six inches, 64; 7 inch to 12 inches, 59. Boiler tubes from store are unchanged at 60 off for steel; 47½ for iron, and 42½ for seamless, base sizes 2¾ inches to 5 inches.

Wire Products.—Mill operations have been facilitated by the seasonable weather of the past month. Delinquent tonnage is being gradually overtaken, and deliveries are in better shape than since the first of the year. Shipments of wire nails can be made in two weeks, and on barbed wire in three to four weeks. Smooth wire is slower. No cessation is noted in the volume of business, June being one of the heaviest months of the year. Jobbers' quotations are without change as follows:

Wire nails, $2.18; painted barb wire, $2.33; galvanized barb wire, $2.63; smooth annealed wire, $2.03; smooth galvanized wire, $2.33; polished staples, $2.28; galvanized staples, $2.58. Carload lots to retailers, five cents higher; less than carload lots, 15 cents higher.

Coke.—A little better activity is noted in the local market. Melters realize that the bottom has been touched and seem now disposed to place contracts. Furnace coke for the last half is held at $2.30 to $2.40 ovens, and foundry coke at $3.00 to $3.30 Connellsville ovens.

Old Material.—The local market is very apathetic. Considerable buying is being done, but the prices at which the trades are closed vary according to the exigencies confronting the buyer and seller. No standard of values exists and the market is without any backbone. Sheared busheling has sold as low as $11.75, and No. 1 railroad wrought at $15.75, and a considerable tonnage of other materials at the low prices of a week ago. Generally speaking, however, the market has improved in tone, and in some grades gains have been made and held. We have revised our prices, and quote as follows, gross tons being given in the first paragraph:

Old Car Wheels.....	$24.50 to 25.00
Old Iron Rails.....	24.00 to 24.50
Rerolling Rails (3 feet and over)	18.25 to 18.75
Old Steel Rails (3 ft. and under)	18.50 to 19.00
Light Section Relayers, 45 lbs. and under, subject to inspection...	30.00 to 32.00
Relaying Rails, subject to inspection	28.00 to 30.00
Frogs, Switches and Guards....	17.50 to 18.00
Heavy Melting Steel.....	16.00 to 16.50
Mixed Country Steel..... ...	13.00 to 13.50

We quote net tons as follows:

No. 1 R. R. Wrought.....	$15.50 to 16.00
No. 2 R. R. Wrought.....	14.50 to 15.00
Knuckles, Couplers and Springs.	16.00 to 16.50
Shafting	17.50 to 18.00
Dealers' Forge No. 1.....	13.50 to 13.75
Pipes and Flues	12.00 to 12.50
No. 1 Cast, 150 lbs. and less...	18.50 to 19.00
No. 1 Mill.....	10.25 to 10.75
Mixed Busheling (Nos. 1 and 2)	11.50 to 12.00
Country sheet	9.25 to 9.50
No. 1 Boiler Cut.....	11.75 to 12.25
Boiler Punchings	15.00 to 15.50
Cast Borings	10.50 to 11.00
Mixed Borings, etc.....	10.50 to 11.00
Machine Shop Turnings	12.00 to 12.25
Railroad Malleable	16.50 to 17.00
Agricultural Malleable	15.50 to 15.75
Stove Plate and Light Cast Scrap	15.00 to 15.50
Old Iron Splice Bars.....	18.50 to 19.00

CLEVELAND.

Heavy Ore Shipments.—Pig Iron Quiet.—Old Material is Dull.

Office of THE IRON TRADE REVIEW,
Browning Building, July 2.

Iron Ore.—Complete reports of shipments from Lake Superior ranges for June are not yet available, but it is known that the three ports at the head of the lakes have made the immense gain of 969,513 tons, compared with June, 1906. If the other ports hold their own, the total shipments for all ports for June will be 6,458,769 tons. The shipments from the old ranges have not been very heavy, and the outlook is that the total will not be far in excess of that of last year for those ranges. July opens with very heavy business and the lower lake docks will have all they can do to handle the vessels which arrive this week.

Pig Iron.—Some sellers report improvement in demand, but, as a rule, few sales are being made and inquiries are not numerous. The demand for spot iron has almost disappeared and the tonnage available is ample to meet requirements, the usual quotation being $24, Cleveland furnace, for No. 2. We quote, f. o. b. Cleveland, as follows, the higher quotation being for third quarter and the lower for fourth quarter delivery:

Bessemer	$24.00 to 24.40
No. 1 Foundry.....	24.00 to 24.50
No. 2 Foundry.....	23.50 to 24.00
No. 3 Foundry.....	23.00 to 23.50
No. 2 Southern.....	23.85 to 24.85
Gray Forge	22.00 to 22.50

Coke.—The market is dull and shows considerable irregularity in prices. For last half delivery, as low as $1.90 has been done on furnace coke, although the usual asking price is $2.25. Foundry coke is selling at $3 to $3.25, with one interest still holding at $3.50.

Finished Material.—New business is not large. Specifications are heavy and general conditions are sound. Somewhat better delivery is being given on sheets and it is now possi-

ble to obtain the lighter gages in about eight weeks, although in the heavier gages deliveries are from 24 to 26 weeks. Bar iron is firm at recent quotations, with demand fair. Cleveland iron mills have shut down for two weeks. A considerable tonnage of plates and shapes has been sold by independent interests. The new court house will require about 3,000 tons of structural material and the contract will be awarded at an early date.

Old Material.—A midsummer quietness has settled over the old material market and a dull state generally prevails. Prices are somewhat lower, particularly in old car wheels. There is considerable bearish sentiment and lower prices are expected. Among the monthly railroad offerings the Pennsylvania lines west are to close on a lot of 4,000 tons; the Wheeling & Lake Erie will sell a small list at the end of the week; the Big Four is in the field with 1,000 tons and the Erie is asking bids on its accumulations of the past 30 days. We have revised our prices and quote, f. o. b. Cleveland, gross tons, as follows:

Old iron rails	$23.50 to 24.50
Old steel rails (re-rolling)	17.75 to 18.75
Old steel rails (under 6 feet)	17.50 to 18.50
Old car wheels	23.00 to 24.00
Steel boiler plate	14.50 to 15.50
Steel axles	22.00 to 23.00
Malleable iron (railroad)	18.75 to 19.25
Malleable iron (agricultural)	17.25 to 17.75
Heavy steel	16.50 to 17.00
Country mixed steel	15.25 to 15.75
Low Phosphorus	21.50 to 22.50

We quote net tons as follows:

No. 1 R. R. wrought	$16.50 to 17.00
No. 1 busheling	14.50 to 15.00
No. 1 machine cast	18.75 to 19.25
Iron axles	26.00 to 26.50
Axle turnings	13.50 to 14.00
Machine shop turnings	12.50 to 13.00
Grate bars	15.00 to 15.50
Pipes and flues	14.00 to 15.00
Tank iron	12.50 to 13.50
Hoop and band iron	8.50 to 9.00
Sheet iron	7.50 to 8.50
Wrought drillings	12.50 to 13.00
Stove plate	14.50 to 15.00
Cast borings	10.75 to 11.25

CINCINNATI.

Pig Iron Prices Slowly Declining.—Lower Grades Especially Dull.

July 2.

Pig Iron.—Sales of spot iron are still on the basis of last week's reduced prices. There is a limited call for it and $20.50 Birmingham is the most frequent price, but an occasional sale is made at $21.00. A car load of spot northern comes out now and then and goes at $24.00 to $25.00 at furnace. The lower grades are dull and spot gray forge can be had at $18.00 Birmingham, or less. No. 4 foundry is offered at $19.00 Birmingham and is dull. Quotations for prompt delivery, Cincinnati, are as follows:

Southern Foundry No. 1	$24.25 to 24.75
Southern Foundry No. 2	23.75 to 24.25
Southern Foundry No. 3	23.25 to 23.75
Southern Foundry No. 4	22.25 to 22.75
Southern No. 1 Soft	24.25 to 24.75
Southern No. 2 Soft	23.75 to 24.25
Southern gray forge	20.75 to 21.25
Northern No. 1 foundry	25.65 to 26.65
Northern No. 2 foundry	25.15 to 26.15
Northern No. 3 foundry	24.65 to 25.65

Prices for the balance of this year are now of more interest, as the dullness which prevails and the easier feeling evident, with furnaces in a more receptive mood in regard to business submitted for acceptance, has disturbed the previously established schedules. There is hardly enough business under consideration to test the market for minimum prices; but some quotations are currently used in trade talk as representing what could be done on firm offers, and based on the attitude of furnaces in regard to their offerings. Third quarter iron is regarded as quotable at $20.00 to $20.50 Birmingham, and last quarter at $19.00 to $19.50. There is still some northern iron unsold for this year and for this $23.00 for third quarter and $22.00 for fourth quarter are the nominal quotations, f. o. b. furnace.

For the first half of 1908, southern iron is still quoted at $18.50 Birmingham and northern at $20.50 at furnace, but it is currently believed in the trade that $18.00 Birmingham could be done on southern brands.

Prices appear to be slowly weakening under the dull period and how far values may shrink is a matter which is inviting discussion. In this connection it is a matter of comment that most of the iron for second half delivery has been placed at $18.00 to $18.50 Birmingham, and southern interests would be likely to make every effort to maintain this price, or a higher basis in order to keep buyers satisfied with their contracts.

The leading interest in cast iron pipe called for a list of offerings and prices last week, but so far as can be learned there were no orders placed through agencies here. There were no inquiries reported. One sale of 600 tons of Virginia iron was made to a northern Ohio consumer for last half delivery. We quote for fourth delivery, delivered Cincinnati, as follows:

Southern Foundry No. 1	$22.75 to 23.25
Southern Foundry No. 2	22.25 to 22.75
Southern Foundry No. 3	21.75 to 22.25
Southern Foundry No. 4	21.25 to 21.75
Southern Foundry No. 1 Soft	22.75 to 23.25
Southern Foundry No. 2 Soft	22.25 to 22.75
Gray Forge	20.25 to 20.75
Northern Foundry No. 1	23.65 to 24.15
Northern Foundry No. 2	23.15 to 23.65
Northern Foundry No. 3	22.65 to 23.15

Finished Material.—Less than car load business is fairly good and the dealers in these lines report a satisfactory run of orders. Small orders are filled at the following prices here:

Angles, 3 x 3 and over, 2.15c to 2.25c; beams and channels, 15 inches and under, 2.15c; small angles and architectural channels, 2.10c base; plates ¼ inch and heavier, 2.10c; 3-16 inch 2.20c; No. 8, 2.20c; sheets (blue annealed) No. 10, 2.30c; No. 12, 2.35c; No. 14, 2.40c; No. 16, 2.50c; box annealed sheets, Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.75c; Nos. 25 and 26, 2.80c; No. 27, 2.85c; and No. 28, 2.95c. Iron and steel bars, 2.00c base; boiler tubes, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3.15c base; cold rolled shafting, 45 per cent off list; steel tire, 2.10c base.

Coke.—Interest in coke contracts is not so active as two weeks ago, as many foundries have placed their last half business. Spot coke continues easy. Some well-known brands are held at steady prices, but the average run of foundry cokes are quoted at about $3.00 f. o. b. ovens. Some makes are sold lower than this and some are held higher. Spot furnace coke has sold as low as $2.35 and foundry down to $2.85. Quotations in the leading coke producing districts are as follows:

Wise County, Va., Furnace Coke, prompt shipment	$2.40 to 2.50 per ton
Wise County, Va., Foundry Coke	3.00 to 3.10 per ton
Pocahontas Furnace Coke, prompt shipment	2.50 to 2.75 per ton
Pocahontas Foundry Coke	3.00 to 3.25 per ton
Connellsville Furnace Coke, prompt shipment	2.40 to 2.65 per ton
Connellsville Foundry Coke	2.90 to 3.50 per ton
New River Foundry Coke, prompt shipment	3.00 to 3.50 per ton
New River Furnace Coke, contract	2.65 to 2.75 per ton

Old Material.—There is an easy feeling in the market and with the annual shut downs of rolling mills there is not much demand for this class of scrap. We quote, f. o. b. Cincinnati, as follows:

Old No. 1 R. R. wrought net tons	$17.00 to 17.50
Cast machine and f'dy, net tons	19.25 to 19.75
Old iron rails, gross tons	24.50 to 25.50
Old steel rails, gross tons	18.25 to 19.25
Old short lengths, gross tons	18.00 to 19.00
Old iron axles, net tons	26.50 to 27.00
Heavy melting scrap, gross tons	21.00 to 22.00
Stove plate, net tons	15.00 to 15.50
Wrought turnings, net tons	13.00 to 13.50
Cast borings, net tons	11.00 to 11.50
Car wheels, gross tons	24.00 to 25.00

PHILADELPHIA.

Pig Iron Market Dull With Some Tendency Toward Lower Quotations.

Pig Iron.—The market is very quiet, and sales are hardly numerous enough to give a good basis for quotations. These show a slightly downward tendency, as might be expected in view of the prospective July closing of many industries, the greater capacity of the furnaces, which are steadily catching up on orders; the declining tendency in old material and some finished products, and the continued abstention of many consumers, from third quarter purchases. There are many producers who, for

the future welfare of the trade, believe that a decrease of a dollar or two in the price of pig iron would be a good thing, but who want to see the decline come about gradually and in the natural course of events, without any demoralizing sudden drop. The disappearance of premiums for spot deliveries has had the effect of stimulating some third quarter purchases, but buying is on a small scale. Sales of Middlesbrough iron has pretty well covered all the vessels due to arrive this month at prices ranging from $21 to $21.25 in dock. Despite the absence of business, the producers express themselves as well satisfied with the situation and as disposed to stand pat. There is no lack of confidence in the future, but all will feel better when they have positive assurance of good crops and the financial clouds roll away. Prices for the last half, which show some decline, may be given as follows:

No. 1X Foundry	$24.75 to 25.50
No. 2X Foundry	23.75 to 24.75
No. 2 Plain	23.25 to 23.75
Standard Gray Forge	22.00 to 22.50
Basic	22.75 to 23.75
Low Phosphorus	27.75 to 28.00

Finished Material.—A slight drop in plates and refined iron bars reflects the easier condition prevailing in the finished product market. The mills generally have orders enough to keep them busy, but the July closing of many is at hand, and there is the usual midsummer lull. Prices may be quoted as follows: Beams, channels and angles, according to specifications, 1.83½c to 2c; refined iron bars, 1.78½c to 1.83½c; steel bars, 1.78½c to 1.83½c; plates, 1.90c to 1.95c.

Old Material.—The scrap market is distinctly lower, the demand from the mills just at this time of year being at a very low ebb. Quotations, which show reductions in nearly every line, may be given as follows:

Old steel rails	$19.50 to 20.00
No. 1 steel scrap	18.50 to 19.00
Old steel axles	22.00 to 22.50
Old iron axles	30.00 to 31.00
Old iron rails	26.50 to 27.00
Old car wheels	24.00 to 25.00
Choice scrap R. R. No. 1 wrought	20.00 to 20.50
No. 1 yard scrap	18.50 to 19.00
Machinery scrap	21.00 to 21.50
Low Phosphorus scrap	24.00 to 25.00
Wrought iron pipe	16.00 to 16.50
No. 1 forge fire scrap	16.50 to 17.00
No. 2 forge fire scrap, ordinary	11.50 to 12.00
Wrought turnings	16.50 to 17.00
Axle turnings, heavy	17.00 to 17.50
Cast borings	15.50 to 16.00
Stove plates	17.25 to 17.75

The directors of the Detroit Iron & Steel Co. have decided to pay up all back dividends amounting to 13 per cent on July 5. The company's financial statement shows assets of $2,278,174.90.

NEW YORK.

Very Quiet Market With Conflicting Views as to Future.—English Iron Firm.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., July 2.

Pig Iron.—The second half begins with a more quiet market than at any time during the year and with no indications of a renewal of activity at an early date. An analysis of the situation fails to shed much light on conditions. Those on the bearish side of the market point to the fact that there is practically no new inquiry of sizable tonnage, that some large inquiries sent out several weeks ago are still unfilled and will probably remain so indefinitely, and that the tonnage released by the Milliken failure is sufficiently large to destroy the carefully adjusted balance of supply and demand which has characterized the pig iron industry for some time. The bears, on the other hand, can point out that the early Milliken iron has practically all been resold without causing an appreciable break in prices, one large furnace interest finding a purchaser for its share of the tonnage within two days after the failure. They admit that furnaces are receiving occasional requests for the holding up of shipments, but state the requests for anticipations on contracts are much more numerous. Finally, they see an evidence of the inherent strength of the market in the fact that furnaces are not making an eager search for new business in early delivery iron and that concessions on forward deliveries have been exceedingly few.

In this district the tonnage of business handled during the six months just ended, in most cases, has been the heaviest on record. The June tonnage, however, was generally very light and the past week has developed no new business of importance. Selling interests state that their representatives find foundries and manufacturing concerns well supplied with work and the usual run of small business is resulting.

In the British market, the heavy shipments from Middlesbrough yards continue, the last report from Connal's yards showing a reduction of 12,000 tons a week, down to 274,000 tons of No. 3 Middlesbrough. A slight resumption of the continental demand is noted, but no new contracts are being made for shipment to America. Loading facilities are improving. No. 3 Middlesbrough is holding its own so far as price is concerned, on the level of 56 shillings. Local concerns are holding British iron in small lots at $21.25 to $21.50 tidewater, but a sale of 500 tons at Boston is reported at $20.50. In domestic irons prices continue without change on the following level, the higher quotation being for spot delivery:

Northern Foundry No. 1	$24.00 to 25.00
No. 2X Foundry	23.50 to 24.50
No. 2 Plain	23.00 to 24.00
No. 2 Southern Foundry	23.50 to 25.50
Basic	23.00 to 24.00

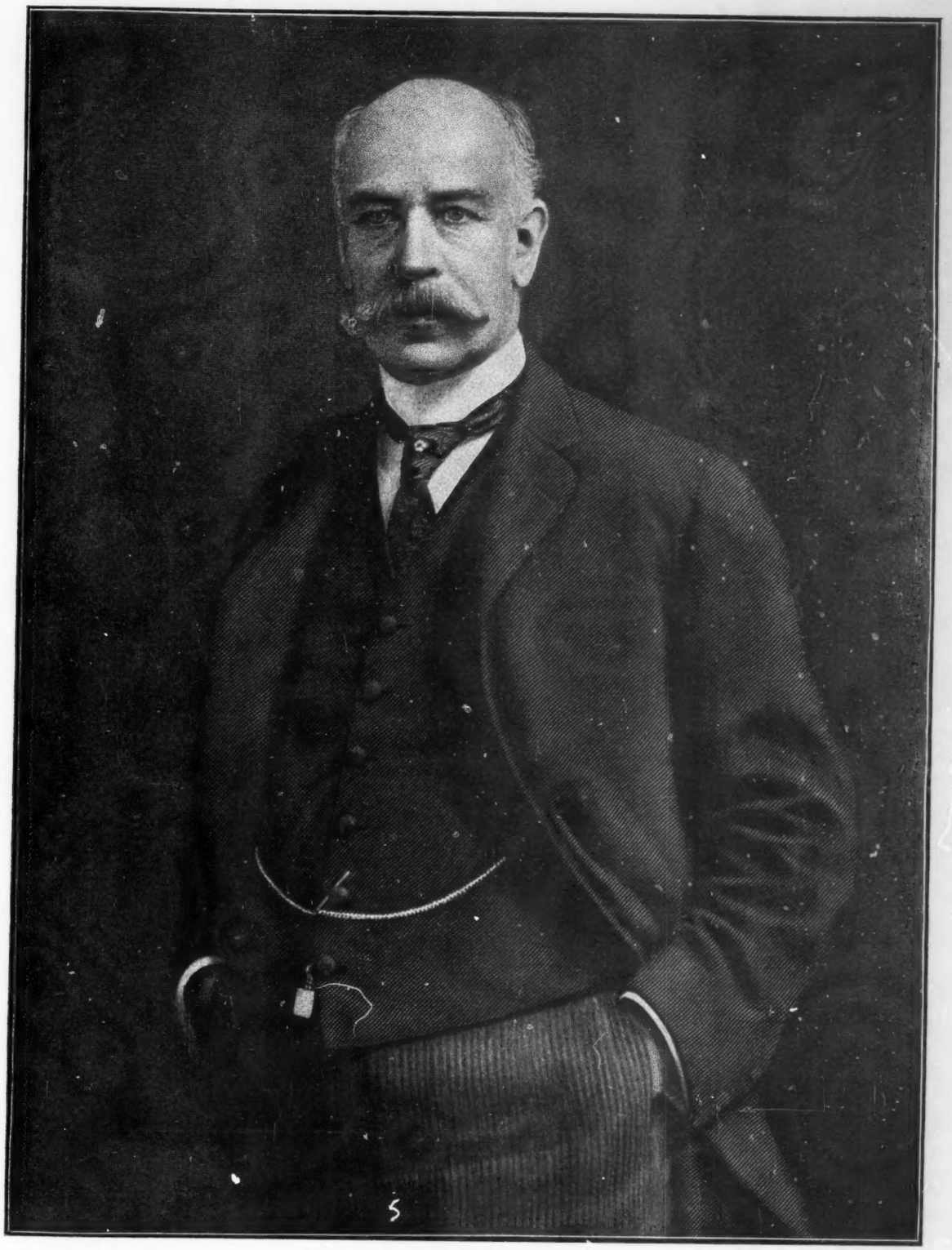
Ferro-Manganese.—There is no activity in the eastern market and prices are slightly lower, with no premiums for spot or early shipment. For 80 per cent at tidewater we quote $62.00.

Finished Material.—The tonnage of structural business booked during June was smaller than during previous months, being estimated at about 60,000 tons. The New York Edison Co. has received bids for the construction of a power house, involving about ,000 tons of steel, but no award has been announced. The American Bridge Co. has taken about 7,000 tons of bridge business for the Great Northern and miscellaneous contracts aggregate some 1,500 tons. Some export business is pending, including 1,700 tons of rails for the Cuban Eastern. In cast iron pipe, Passaic, N. J., is asking bids on 4,000 tons and Hoboken, N. J., on 1,800 tons. New York opens bids Wednesday for about 6,500 tons of standard pipe. No change is noticeable in other lines. We quote:

Angles, 3 to 6 inches x ¼ inch and heavier, 1.86c; beams, 3 to 15 inches, 1.86c; tees, 3 x ¼ and heavier, 1.91c; plates, carloads, tank, 1.96c; marine boiler, 2.26c; bar iron, 1.86c; soft steel bars, 1.76c; sheets, No. 28, black, 2.60c.

Old Materials.—The week has witnessed several changes as regards demand, but few in values. Steel scrap is holding up well, but lower figures are looked for within thirty days. Rolling mill materials are off both in demand and price, but this is probably only temporary, as an immense amount of work is in sight. Better deliveries of pig iron have resulted in a lessened demand for cast scrap, which heretofore has owed considerable of its strength to the backwardness of furnace interests.

Reviewing the market of the year, one of the best informed scrap men in this district says: "Business for the past six months has been greater in the scrap iron line than ever before in the history of the trade.



FRANK J. HEARNE.

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Practically all that is available has been gathered up and shipped in. Prices have been good and the demand, at some times during the period, has been in excess of the supply. Although the failure of one of the largest steel scrap consumers in this section has complicated the situation somewhat, it will have no lasting or material effect, though it has undoubtedly been made much of by some buyers. However, this concern had no large supply of scrap on hand and if its operations are continued, as is possible, it will be in the market again. The outlook for steel scrap is very bright, but the present high prices will hardly hold."

We quote New York prices, gross tons, as follows:

Old iron rails	$24.50 to 25.50
Old steel rails, rerolling	18.00 to 18.50
Relaying rails	27.00 to 28.00
Old car wheels	24.00 to 24.50
Old iron car axles	28.50 to 29.50
Old steel car axles	21.00 to 21.50
Heavy melting steel	16.00 to 16.50
No. 1 railroad wrought	18.00 to 18.50
Iron track scrap	17.00 to 17.50
Wrought pipe	14.00 to 14.50
Cast borings	14.00 to 14.50
Wrought turnings	14.75 to 15.25
Heavy cast scrap	18.75 to 19.25
Railroad malleable	17.00 to 18.00
Agricultural malleable	15.00 to 16.00
Stove plate	15.50 to 16.00
Grate bars	14.50 to 15.00

BUFFALO.

Little Last Half Iron Available and Demand is not Active.

July 2.

Pig Iron.—The market is characterized by inactivity and light business all around in pig iron, although the prices remain unchanged and retain a firm tone, which will in all probability continue. There is a very small tonnage of the last quarter which is still unplaced, and there seems to be no anxiety among the furnaces by reason of it. Some large consumers have been nosing around for prices, and reports say offers have been made for last quarter iron which were $3 less than schedule quotations. Inquiry fails to show that such offers have been accepted, indicating confidence among those controlling the local output.

So far as prompt iron is concerned, there is very little to be had, and the call is correspondingly light, as the general understanding is that most of the consumers are pretty well stocked up and do not feel any urgent need. Again, many of them are holding back to watch the market, for it has become more interesting of late by reason of the long period during which the firm prices have continued. Notwithstanding the fact that there is no schedule for first quarter, some selling for delivery then has been made, but prices are given only upon inquiry.

Some southern tonnage has been placed the past week, No. 2 being $18.50 at the furnace, freight charges being $4.90. A small tonnage for prompt delivery, Southern No. 2 foundry, one lot being 150 tons, was offered here today at $21 f. o. b. Birmingham.

We quote for last quarter delivery as follows:

No. 1X Foundry	$23.75 to 24.00
No. 2X Foundry	23.00 to 23.50
No. 2 Plain	22.50 to 23.00
No. 3 Foundry	22.75 to 23.00
Malleable Bessemer	23.00 to 23.50
Gray Forge	22.00 to 22.50
Charcoal	27.00 to 27.50

ST. LOUIS.

High Prices for Spot Pig Iron Have Disappeared.—Coke is Weak.

July 1.

Pig Iron.—Spot iron is selling at from $21.50 to $22.00 per ton, f. o. b. Birmingham, for No. 2, and in some instances a price of $22.50 has been obtained. The fancy prices for spot seem to have disappeared. Third quarter iron is selling at $21.50 to $22.00, and the last quarter is quoted at $20 to $21.50. Some business is reported to have been booked for the first quarter and first half of 1908 at $18.50, but the aggregate tonnage is not large. Our quotations for spot, f. o. b. Birmingham, to which $3.75 freight is to be added, follow:

No. 1	Southern	$22.00 to 22.50
No. 2	Southern	21.50 to 22.00
No. 3	Southern	21.00 to 21.50
No. 4	Southern	20.50 to 21.00

Coke.—Spot continues weak, with not much demand expected throughout July and probably August. Prices on contract coke for shipment over last half of 1907 and the first half of next year are strong at $3 to $3.50 per ton f. o. b. ovens. Operators report plenty of inquiries and a satisfactory number of orders. A large tonnage of furnace coke was sold June 28. The freight on coke to East St. Louis is $2.80 per ton, and to St. Louis, $2.90. St. Louis dealers have not been notified of the effectiveness of the anticipated advance in freight rates on coke.

Steel.—Inquiries are good except for standard rails. Prices are firm, and no cutting is reported. Standard rails indicate better prices for 1908 delivery. St. Louis dealers are interested in a 15-story building that is projected by the Grand Avenue Methodist church, in Kansas City, to be occupied as a church, banking house and office building. Plans are under way for the erection of such a structure on the site of the present church, Ninth street and Grand avenue, Kansas City, Mo. The ground dimensions of the building will be 206 feet by 55 feet.

Scrap Iron.—The market is firm with practically no change in prices since last report. Our quotations, f. o. b. St. Louis, follow:

	GROSS TONS
Second-hand Relaying Rails, according to time of delivery	$29.00 to 32.00
Steel rails (less than 3 feet)	17.00
Car wheels	24.00
Iron rails	24.50
Rerolling steel rails	18.00
Heavy melting steel	17.50
Country steel mixed	16.00
	NET TONS
No. 1 R. R. wrought	$16.50
No. 2 R. R. Wrought	15.50
Iron splice bars and fish plates	19.00
Iron car axles	24.60
Steel car axles	19.50
Locomotive tires, smooth inside	15.00
Iron shaftings (3 to 6 inches)	19.00
Country wrought	15.00
Pipes and flues	13.00
Heavy machinery	19.00
R. R. cast (less than 300 pounds)	17.50
No. 1 Busheling	14.00
No. 2 Busheling	13.50
Boiler sheet and rings	13.00
R. R. cast borings (free of inferior quality)	10.50
R. R. wrought turnings	13.50
Machine shop turnings (free from brass)	12.00
Railroad malleable	16.50
Agricultural malleable	15.25
Cast stove plate	14.50

BIRMINGHAM, ALA.

Foreign White Labor Proving Satisfactory.—Pig Iron Market Firm.

July 1.

It is estimated that the iron production during the past month was every bit as good as it was in May, if not better, and that the month just started in will show a decided improvement. The Gadsden furnace of the Southern Steel Co. lost a little time the past month for necessary repairs, but is again in full operation. The same company will start up its Rising Fawn, Ga., furnace in the next four or five days. The Sloss-Sheffield Steel & Iron Co. has started one of its furnaces which has been under repair for some time and during this month will start another. The Tennessee Coal, Iron & Railroad Co. and the Woodward Iron Co. are expected to have a furnace ready for the torch this month also. The efforts being made to increase the raw material supplies, especially as to ore, are having results now, the output of ore being almost adequate for all demands. The Tennessee company is replacing considerable of its negro labor at the ore mines in the southern part of Jefferson county with white foreign laborers, using sturdy Germans, just brought to this country, for that purpose. The state immigration commissioner recently made a trip to Germany and Belgium and he succeeded in securing a number of immigrants who want to work in the industrial district and others are to follow in the near future. A week's

trial convinces those who are watching the labor that the foreigners are going to make good men for the work and fine results are being obtained. The supply of ore has been the only thing that has given the least apprehension in the industry hereabouts.

A few sales of pig iron are still being made by the Alabama furnace companies for delivery during the last quarter of this year. Some orders are being booked for the first half of the coming year, but so far the aggregate of this business is not very extensive. Prices hold firm, fourth quarter iron being quoted at $21.50 per ton, No. 2 foundry, and for the first half of the coming year at $18.50 per ton, No. 2, foundry. There is not a great amount of the better grades of iron to be obtained for delivery during the fourth quarter of this year.

Iron is leaving the furnaces in this section as rapidly as it is being manufactured. The furnace yards are more barren now than they ever were in the history of the industry. The home consumption is still very heavy.

BRITISH IRON MARKET.

Unexpected Fall Followed by Recovery.—Many Orders on Hand.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., June 19.

Pig iron prices have had an unexpected fall during the past week, the selling figure of Cleveland on Monday reaching 56s 1d ($13.72). There was a slight improvement yesterday of 3d, and today a further gain has been registered of 9½d, bringing the selling figure up to 56s 10½d ($13.91). Apparently, this recovery will continue. The fluctuations have rather puzzled experienced buyers, in view of the enormous character of the shipments. For example, during the present month we have sent away 70,031 tons, compared with 56,472 last month, and warrants are still reducing at about 2,000 tons per day. The present holding is 290,500 tons. The simple explanation is that there are a number of weak holders of warrants whose nerves are upset by every suggestion of relaxation in American buying. They throw their iron on the market on the slightest provocation, and this lowers general values. Glasgow is showing a marked recovery, and there is every probability that Cleveland will follow suit. It is very significant that Cleveland fluctuations have not had the slightest influence upon any of the Midland irons, such as Northampton, Derbyshire and Staffordshire, which are in demand as much as ever with great firmness in price. The same is true of West Coast pig iron which sells well and smelters have their books full of orders.

METAL MARKET.

NEW YORK.

July 2.

Copper.—The deadlock continues, though with the prospect that the expected break will be forthcoming before long. There is some selling of electrolytic for export at slightly lower prices. Quotations, largely nominal, are as follows: Lake 23½c to 24c; electrolytic, 22c to 22½c; casting, 21c to 21½c. Considerable improvement is noted in the British market, however, the closing price yesterday at London being £99 for spot standard and £99 15s for futures.

Pig Tin.—A somewhat better tone prevails through the growing scarcity of spot metal. The foreign market is also improved and the premium on early shipments is increasing. Domestic prices range from 43½c for spot metal down to 41¼c for August shipments. The London close yesterday was £192 15s and £181 15s, a range of £11.

Pig Lead.—At current prices business is not brisk. For spot delivery New York 5.75c is quoted, with St. Louis at 5.65c. Soft Spanish closed yesterday in London at £20 15s, slightly higher than a week ago.

Spelter.—There is eagerness for business among producers, but the market continues quiet at the following level: Refined, 6.30c to 6.45c, according to delivery at New York; St. Louis, 6.25c to 6.30c. G. M. B. closed yesterday on the London market at £24 5s.

Antimony.—The market has not become appreciably stronger and business is of small volume. Cookson's is nominal at 15c to 15½c; Hallett's at 13c to 13½c; ordinary brands, 11c to 12c.

CHICAGO.

July 2.

A general decline in prices characterized the metal market during the past week. The drop in all cases except antimony was small. As a result the volume of sales increased somewhat because of the lower prices. Copper lake sold for 26c and casting between 24c and 24½c. Sheet zinc was quoted at 8.60c La Salle in car lots of 100-pound casks. Spelter remained at 7¼c. Pig tin varied between 45¼c and 45½c. Lead desilverized dropped to 6c and 6.10c in 50-ton lots, and corroding to 6.70c and 6.90c. The price in car lots was 2½c higher. Cookson's antimony dropped from 24c and 25c to 20 and 21c; other grades dropped from 23c to 18c.

The second-hand metal market because of dull conditions, prices showed very weak. Buyers prices on all metals fell off. Prices quoted were:

Copper, wire, 17.50c to 18c; copper, heavy, 17c to 18c; copper, bottoms, 16c to 17c; copper clips, 16c to 18c; red brass, heavy, 16c to 16.50c; yellow brass, heavy, 13c; red brass, borings, 14c; yellow brass, borings, 12c; light brass, 10c; zinc, 4.50c to 4.75c; pipe lead, 5c; tea lead, 4.25c to 4.75c; tin foil, 31c to 33c; pewter No. 1, 27c to 29c.

ST. LOUIS.

July 1.

Lead and Zinc.—Enormous gains are shown for the first half of 1907, ending Saturday night, June 29, as compared with all previous years.

The total increase in zinc was 22,492 tons, and in lead 6,000 tons, aggregating an increase in value of $2,073,733.

The half year has been the most prosperous in the history of zinc-lead mining in the Joplin district, and indicates a total valuation of over $18,000,000 for the year.

Prices of zinc were unchanged during the week at $46 to $48 base price, the highest reaching $51 per ton. Lead prices slumped $6 per ton, closing weak at $68.

Quick Rebuilding.—The Utica Drop Forge & Tool Co., Utica, N. Y., which lost its entire building by fire June 25, states that plans have already been made and contracts let for the reconstruction and equipment of the plant. The new plant will have nearly twice the floor area of the one that was destroyed and the capacity for the delivery of tools will also be largely increased. The company expects to be able to ship tools to its customers by the first of September for the fall trade. The old works were insured for $200,000. Wm. Pierrepont White is president, Hugh White secretary and treasurer, and H. F. Kelleman superintendent.

Award Battleship Contracts.—The United States government, through Secretary Metcalf, has awarded the contract for the construction of two 20,000-ton battleships, one going to the Newport News Ship Building Co., at a bid of $4,000,000, and the other to the Fore River Ship Building Co., Quincy, Mass., at $4,377,000. Of the armor for these two battleships the Bethlehem Steel Co. will furnish 3,602 tons, the Carnegie Steel Co., 3,545 tons and the Midland Steel Co., 2,230 tons at prices ranging from $400 to $420 a ton, these contracts having also been awarded by the war department.

PERSONALS.

J. E. Snyder, Worcester, Mass., builder of upright drills, has just recovered from a severe illness.

E. M. Adams has been made secretary of the Inland Steel Co., with offices in the First National Bank building, Chicago.

Joseph D. Gallagher, of the American Brake Shoe & Foundry Co., has sailed for Europe for a six weeks' tour abroad.

J. P. Sykes, heretofore superintendent of the Eddystone plant of the Baldwin Locomotive Works, has been transferred to the Philadelphia plant.

Garry Levan, Sharon, Pa., has been appointed superintendent of the furnaces of the La Belle Iron Works, Steubenville, O. Mr. Levan was formerly manager of the Republic Iron & Steel Co., Birmingham.

Arthur J. Singer, formerly a member of the firm of C. G. Gates & Co., has been appointed assistant to President E. A. S. Clarke, of the Lackawanna Steel Co. Mr. Singer will have special supervision of credits.

District Manager J. W. Deetrick, of Youngstown, presided at a dinner given June 27 at the Youngstown club in that city to a party of sales agents of the Republic Iron & Steel Co. An inspection of the Youngstown plants of the company preceded the dinner.

Edward McVey, formerly superintendent of the Brown-Bonnell works of the Republic Iron & Steel Co., Youngstown, is now superintendent of the plant of the Seneca Iron & Steel Co. at Blaisdell, N. Y. James Patterson, of Youngstown, is general manager of the plant.

P. G. Ten Eyck has been appointed vice president of the Federal Railway Signal Co., with headquarters at Albany, N. Y. The officers are now composed of J. T. Cade, president; Lawrence Griffith, vice president; P. G. Ten Eyck, vice president; Frederic Pruyn, treasurer and C. E. Newman, secretary.

R. E. Fox Jr. has resigned as manager of the New York office of the Platt Iron Works Co. to become secretary and manager of the sales department of the Engineer Co., 111 Broadway, New York. Mr. Fox is a graduate of the Cornell university and is a member of the American Society of Mechanical Engineers.

Ganson Depew of Buffalo has been elected a director of both the Buffalo & Susquehanna Coal & Coke Co. and the Buffalo & Susquehanna Coal Mining Co. to fill the vacancy caused by the death of Frank H. Goodyear. Charles W. Goodyear has been elected president of the two companies and Ganson Depew vice president.

O. H. Gentner Jr., of Philadelphia, has been engaged as assistant engineer in charge of estimating and drafting in the reinforced concrete department of the General Fireproofing Co., and will make his headquarters at Youngstown, O. Mr. Gentner has been prominently identified with reinforced concrete construction work with various firms in the east.

T. M. Girdler, formerly assistant superintendent of the merchant mills, Colorado Fuel & Iron Co., Pueblo, is now with the Atlanta Steel Co., Atlanta, Ga., as superintendent of the rolling mill department. J. B. Johnston, superintendent of the hoop and rod mills, retires July 15, to be succeeded by W. J. Hartley, who will be assistant to Mr. Girdler.

Alexander Yule, secretary of the DeCamp Bros. & Yule Iron, Coal & Coke Co., returned to St. Louis, Sunday, June 30, from a nine weeks' trip in Europe. During his stay abroad, Mr. Yule investigated iron conditions in England and Scotland, and found the manufacturers decidedly optimistic about the future welfare of the trade. He found prices to be good and inquiries large.

LATE RAIL SALES.

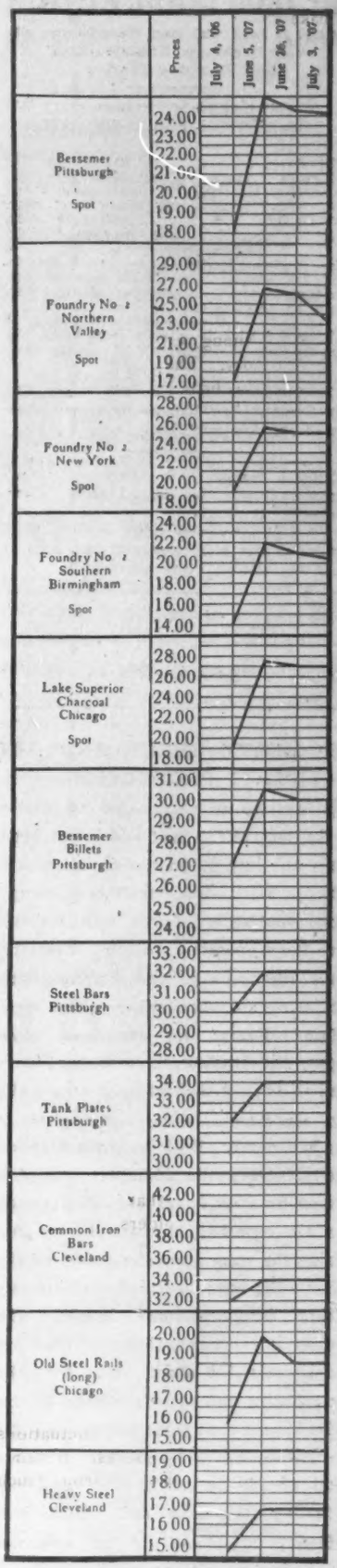
(Special Telegram.)

New York, July 3.—Rail sales of the week include 13,500 tons for the San Pedro, and about 5,000 tons in small lots, chiefly to trolley roads. Continental buying is again reported in the British iron market, which is slightly stronger, with Cleveland warrants at 56 shillings 7 pence.

Sales Agents Meet.—The selling organization of the Republic Iron & Steel Co. and the Tennessee Coal, Iron & Railway Co., held its regular meeting at Youngstown, Ohio, on June 27 and 28. The selling agents from the various offices of the companies were present. The company has practically withdrawn from the market on nuts and washers for near deliveries, owing to heavy sales of these articles. The general opinion was that the outlook for business for the remainder of the year was good. The mills are all running and have a very satisfactory line of orders and specifications on their books.

The foundry of the Christiansburg Chilled Plow & Machine Works, Christiansburg, Va., was heavily damaged by fire June 26.

PRICE CHART.



THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND

BUFFALO.....932 Ellicott Sq.
CHICAGO.....1362 Monadnock Blk.
CINCINNATI.....124 Government Place.
NEW YORK.....1005 West Street Bldg.
PITTSBURG.....521 Park Bldg.
DULUTH.....411 Providence Bldg.

Subscription, United States and Mexico, $3.00 per annum. To Canada and Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co., will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND, AS SECOND CLASS MATTER.

PRINTED IN AN OPEN SHOP

July 4, 1907.

THE HEAVY SHEET AND TIN PLATE PRODUCTION.

Production of sheets and tin plates in the six months just ended has been easily the largest on record for such a period. With but occasional exceptions, the mills of the independents have been operated to full capacity, while the mills of the leading interest have run more steadily than ever before. Except for occasional stoppages, the leading interest has operated all of its 170 sheet mills during the past six months, while in tin plates it has run nearly all of its productive capacity. Only the Humbert and Anderson tin mills have been idle through the six months; Morewood was run during the second quarter, while all the other mills were operated continuously except for occasional breaks. The leading interest has, then, operated approximately 170 sheet mills for the six months, and approximately 227 tin milsl for the first three months and 235 for the second three months. It has a total of 248 tin mills, this total not including the Star mill, which was definitely abandoned as an operative plant after its closing on Jan. 1.

If the leading interest's production during the second half of this year bears the usual ratio to the first half production, its output of tin plates and black galvanized sheets in 1907 can be forecasted at about 1,300,000 gross tons, against 1,112,542 gross tons in 1906 and 924,439 gross tons in 1905.

The American Iron and Steel Association's estimate of the tin plate output in 1906 has not yet been announced, but will probably fall in the neighborhood of 550,000 gross tons. The production in 1907 should easily pass 600,000 gross tons.

The conditions for a large output of tin plates in the second half of this year are especially favorable. Usually a heavy spot demand is experienced at this time of the year, and the mills make every effort to provide for it by maintaining some stocks. This year the spot demand is light, yet the mills have accumulated no stocks of consequence, having run to full capacity and shipped the material as promptly as car supply permitted. The failure of the spot demand has been due partly to lateness of crops, whereby the demand is merely postponed, and will be experienced during the third quarter.

The country is not materially increasing its tin plate making capacity this year, the larger output being due to more steady operation of mills, and in some degree to larger outputs per mill.

The sheet making capacity is being materialy increased. The leading interest has in the past few months completed and put in operation eight additional sheet mills at the Vandergrift works, making this a 37-mill plant. It is adding four mills at the Guernsey works, Cambridge, and is making some minor increases elsewhere. The semi-continuous mill at the Mercer works, Sharon, is being operated more steadily. A number of additions to capacity are being made in the independent ranks. The most important of these is the building of a complete sheet mill by the La Belle Iron Works, comprising eight sheet and two jobbing mills, which should contribute two or three months' work to this year's output.

The unusually good prospects enjoyed by the sheet and tin plate industries is shown by the unusual distance ahead to which the sheet bar market is sold up. The two leading outside producers, with steel mills at Youngstown, are sold up on sheet bars for the entire year. While the Carnegie Steel Co. has from time to time canceled sheet bar contracts, it still retains a considerable share of the business, and has announced $31 as the settlement price on third quarter deliveries against adjustment contracts, its price for the three preceding quarters having been $30.

THE IRON WAGE SCALE NEGOTIATIONS.

The failure of the second conference last week between the Western Bar Iron Association and the Amalgamated Association is not surprising. These scale settlements are usually reached first with the leading interest. At the time of this writing it does not seem probable that the second conference with the Republic Iron & Steel Co. can be arranged for the current week, but the parties have through next Wednesday, the 10th, to make a settlment, before the conciliation feature of the wage agreement becomes effective. This arrangement, which is not common to the other Amalgamated Association scales, covering sheet and tin mill wages, provides that if no agreement is reached by July 10, a conciliation board is selected, before whom the parties argue their case and endeavor again to reach a settlement; if none is reached in this manner, the conciliation board deliberates apart on the evidence and arguments presented, and reaches a conclusion. This conclusion is not binding upon either party, as the spirit of the arrangement is conciliation and not arbitration, but considering the circumstances a refusal of either side to accept the finding of the board is practically precluded. Meanwhile, or at least until August 10, the mills can be kept in operation, at the previously prevailing rates of wages. In the present instance, the delay is in favor of the manufacturers, as the demand is for an advance in wages, while there is no

demand for a reduction. In 1904, no limit was set for an agreement being reached, and the point at issue was a reduction in wages. The work of reaching a settlement was so drawn out in that year that the Republic company issued an order closing its mills Sept. 1, as it objected to continue for a longer time the paying of the old wages.

An unusually broad question is presented in this scale matter. Years ago the problem was much simpler, involving little outside the diffuse subject, on the part of the manufacturers, of their "ability to pay" the wages demanded, and on the part of the men, the arduousness of their work, etc. As a matter of fact, the relative strength of the two parties in the final analysis, determined the nature of the settlement. In the present case a much broader problem is presented. The products made under the iron scale are made from pig iron and scrap, chiefly scrap. They are sold in competition with steel products. The raw material, scrap, is bought in competition with the basic open-hearth steel furnace. The competition between steel and iron is keener than it was years ago, while the competition of the basic open-hearth steel furnace is new.

There is scarcely a grade of scrap used in iron mill operations which cannot be used to more or less advantage in the basic open-hearth steel furnace. Some of these grades of scrap facilitate the finishing of a heat of steel and are therefore worth to the steel maker prices commensurate with that of pig iron, and pig iron is very high in price. Other grades are not so advantageous, but each has a point, at some margin below the price of pig iron, at which its use in steel making is advantageous.

The basic open-hearth process has made an enormous drain upon the scrap outcome. Prior to 1897 not so much as a million tons of basic open-hearth ingots and castings were made in a year; in 1897 the production was a trifle over a million tons, involving the consumption of about half a million tons of scrap. In the present year the output of basic steel, and the consumption of scrap, will be about ten times as great. In the brief period of ten years, an industry has grown up which takes from the supply close to 5,000,000 tons of scrap. It is true that much of this material is new, and does not pass through the market as scrap, but it is scrap just the same.

By many the basic open-hearth steel furnace is regarded as the legitimate channel by which old material should be remade into new material for the market, both on account of the economy of the process and because of the regularity of the product. Outside of the cost of raw materials, the chief item of expense of the iron mill is the wage cost. If the sum of the two reach an undue level, then the iron mill's raw material will go to the open-hearth furnace. There is no getting away from the economic principles involved, as it is purely a matter of supply and demand. Fortunately for the men, the law of supply and demand operates with them also. The supply of puddlers is small. For years few men have been learning the trade, and while puddling is not a short lived occupation, still puddlers do die. With scrap being taken each year in larger and larger proportions by the steel industry, the iron mill business must strike a balance, through the wage scale, between demand and supply in scrap, and demand and supply in men.

THE TECHNICAL STUDENT AND THE CATALOG.

In a recent issue of THE IRON TRADE REVIEW consecutive personal items recorded two important changes of position, one to the superintendency of a large group of furnaces and the other to the general managership of a western concentrator concern. Less than half a dozen years ago the furnace superintendent enjoyed a wide reputation as punter on his football eleven and the concentrator man, on a rival team, could bear witness to his prowess. The two were known to the writer, and this bit of information is merely to emphasize the fact that the course from the technical college to the position of responsibility is in many instances exceedingly brief.

It is generally admitted that at the time the young man is in the engineering college or the technical school his mind is in a formative state and the impressions he there receives are of a lasting character. Foundry and machine tool interests in recent years have indicated that they recognize this conditions by liberal response to the appeals of technical schools and universities for equipment. They have found that once the student has become familiar with their machinery and apparatus and has learned its operation, he is extremely likely to be influenced toward its selection when the times comes that he is in position to recommend or dictate purchases. However varied his later experience may be, the name of the manufacturer sticks in his memory and the machine appeals to him as more or less a standard in its line.

One of the things toward which the advertiser is ever directing his best efforts is to impress upon the possible purchaser the name of the concern he represents in connection with the products which it turns out. His lathe or drill in the equipment of the university machine shop or his molding machine in the technical school foundry always brings permanent returns to the manufacturer and has come to be recognized as a legitimate method of publicity. But the field is of course extremely limited and the cost is considerable, so that for the bulk of manfacturers this method is impracticable.

Some of these have found that extremely good results are obtainable through the careful distribution of catalogs to among the more advanced classes of trade schools and colleges. They have learned that these catalogs reach the student when he has sufficient leisure to insure their being given thorough study, and that in this manner the name and the product are linked and stamped indelibly upon his mind. It is a "building for the future" proposition, of course, but it pays in the long run and is unique in that it has not been overworked. Accurate mailing lists can easily be secured from college authorities and the cost of the catalog and its distribution is not large.

To such concerns as are always in need of technical graduates to recoup and add to their engineering forces, this method commends itself for the

reason that, by calling the student's attention to the company and its products a considerable time before he is ready to seek employment, a kind of familiarity is fostered and a prejudice in its favor is originated and encouraged to such an extent that upon graduation, the young man will be more likely to take service there than with the concern whose name and manufactures are unknown to him.

MEETING OF THE SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION.

The fifteenth annual meeting of the Society for the Promotion of Engineering Education was held at the Case School of Applied Science in Cleveland on July 1, 2, and 3. It was attended by professors in engineering schools from all over the country; about 70 members registered.

The sessions were devoted chiefly to the presentation and discussion of a great number of papers on educational subjects. Among the more important papers are the following: "Engineering Chemistry and Chemical Engineering," by Prof. Charles F. Mabery of the Case School of Applied Science; "An Educational Experiment," by William G. Raymond, dean of the College of Applied Science of the University of Iowa. This experiment was in what was called individual instruction, as distinguished from class instruction; "Technical Education with a View to Training for Leadership," by F. W. Atkinson, president of the Polytechnic Institute of Brooklyn. This describes a new kind of engineering school, one designed to take selected students only and train them with a view of making them leaders in the profession; "The Work of the Dean of the School of Engineering" was the title of three papers by three different deans of engineering colleges, namely, Louis E. Reber, Pennsylvania State College, F. E. Turneaure, University of Wisconsin, and James M. White, University of Illinois. The whole afternoon of July 1 was devoted to the discussion of methods of teaching of physics and mechanics to engineering students. A reception was given by the ladies of the faculty of the Case School of Applied Science to the visiting professors in the library of the physical laboratory on Tuesday afternoon, and on Tuesday evening the trustees and faculty of Case School entertained the members of the society at dinner at the University Club, when the president of the society, Prof. Dugald C. Jackson of the Massachusetts Institute of Technology, delivered his presidential address on "The Relation of the Engineering Schools to the Secondary Industrial Schools."

The session on Wednesday was devoted chiefly to the subject of industrial education, a report of the committee on that subject being read by Prof. Kelvin M. Woodward of Washington University of St. Louis. The co-operative engineering course of the University of Cincinnati was treated on by Charles S. Gingerich, representing the Cincinnati manufacturers and by Prof. Herman Schneider, dean of the College of Engineering of the University of Cincinnati. Charles F. Scott, consulting engineer of the Westinghouse Electric & Mfg. Co., presented a paper on "The Technical Graduate and the Electric Manufacturing Company," and "The Students' Apprenticeship Course" was discussed by Albert C. Wessling of the Allis-Chalmers Co., and Charles E. Downton of the Westinghouse Electric & Mfg. Co.

This meeting is one of the most important the society has ever had, and it was characterized by great vigor in the debates and enthusiastic interest in all the subjects presented.

FOREIGN PIG IRON IMPORTS HAVE DOUBLED.

Foreign pig iron imports to the United States have more than doubled during the past year, and have increased nearly fivefold over 1905. According to the monthly summary of imports and exports by the national department of commerce and labor, there were shipped into this country during the month of May of this year 66,276 tons dutiable of foreign iron, against 61,304 tons in April, 1907, and 28,848 tons in May, 1906. May completed the eleventh month of the present fiscal year. During the past 11 months the total imports were 519,961 tons dutiable, compared with 248,884 tons for the 11 months ending May, 1906, and 105,860 tons for the 11 months ending May, 1905.

Crude Steel Imports.—The month of May developed a decrease in the crude steel receipts. The imports for the month were 1,506 gross tons, compared with 926 gross tons in April, 1907, and 1,595 gross tons in May, 1906. For the 11 months ending May, 1907, the imports aggregated 17,616 gross tons, against 17,368 gross tons for the corresponding period in 1906, and 8,891 gross tons for 1905.

Iron Ore Imports.—Steady gains are shown in the shipments of iron ore to the United States from foreign mines. The total for May, 1907, was 136,266 tons dutiable, against 137,605 tons in April, 1907, and 117,277 tons in May, 1906. For the 11 months ending May, 1907, the aggregate imports of ore were 1,026,209 tons dutiable, compared with 888,469 tons in the corresponding period ending May, 1906, and 689,925 tons in 1905.

Steel Rail Exports.—The tonnage of American steel rails that finds its way to foreign markets is gradually decreasing. The exports in May, 1907, were 11,726 tons, against 40,012 tons in April, 1907, and 37,789 tons in May, 1906. The 11 months ending May, 1907, compared with similar periods in other years, show the falling off very clearly. For the months ending May, 1907, total shipments were 272,683 tons, against 319,830 tons in 1906, and 387,089 tons in 1905.

Sheet and Plate Exports.—The exports of iron and steel sheets and plates continue to grow. In iron sheets and plates there was sent to foreign markets in May, 1907, a total of 2,925 gross tons, against 4,234 gross tons in April, 1907, and 858 gross tons in May, 1906. The 11 months' period ending May, 1907, shows total exports of 27,156 gross tons, against 8,864 gross tons in 1906, and 4,631 gross tons in 1905. The steel sheet and plate exports in May were 8,954 gross tons, compared with 9,825 gross tons in April, 1907, and 9,290 gross tons in May, 1906. The 11 months' total in 1907 was 90,212 gross tons, against 72,449 gross tons in May, 1906, and 62,111 gross tons in 1905.

Freighters Launched.—Two new ore carriers, the Charles O. Jenkins and the Smith Thompson, were launched at lake ship yards June 29. The Charles O. Jenkins, which is named after its owner, slid from the ways of the American Ship Building Co., at Wyandotte, while the Smith Thompson, owned by the L. C. Smith Transit Co., of Syracuse, N. Y., first touched the water at the Toledo Ship Building Co.'s plant at Toledo. The Thompson will carry 7,500 tons and will be managed by the United States Transportation Co.

The general contract for a number of structures to be built in connection with the shops of the Chicago, Rock Island & Pacific Railway Co. at Armourdale, Kas., has been awarded to the George B. Swift Co., Chicago. The buildings comprise a one-story machine shop, 65 x 165 feet, with brick exterior and composition roor, carried on steel trusses; a 27-stall round-house, a one-story frame store-house, two table and cinder pits and a 320-ton coaling station.

SMOKE NUISANCE DISCUSSED

And Novel Method of Rewarding Firemen is Proposed.

(Special Correspondence.)

Milwaukee, June 29.—The second annual convention of the International Association for the Prevention of Smoke was held in the council chamber of the City Hall in Milwaukee on June 26, 27 and 28. The active membership of the society is composed exclusively of city officials who are more or less connected with the duty of suppressing smoke, such as smoke inspectors, city engineers, commissioners of public service, etc. Associate members are individual consulting engineers and others interested in the subject of the suppression of smoke.

The meeting was attended by smoke inspectors and public officials from Toronto, Milwaukee, Chicago, Cleveland, Pittsburg, Rochester, Syracuse and other places. A large part of the meeting was devoted to routine business connected with the passing of new constitution and by-laws and reports of committees. Considerable discussion was held concerning the smoke laws in different states. It appears that in some states smoke has been declared by law to be a nuisance per se and the emission of dense smoke a misdemeanor and punishable as such in the courts. In these states, therefore, the suppression of smoke by legal action is comparatively easy, but in other states the smoke inspectors have to secure witnesses who can prove actual damage before an injunction be issued or a fine be imposed.

Many discussions were held on the various methods of getting rid of the smoke nuisance, and there was no difference of opinion whatever as to the fact that smoke is completely suppressed by the use of many different kinds of apparatus when they are properly attended to. The chief difficulty is to get firemen who will take care of the apparatus. It was suggested that a way to improve the fireman would be to raise his wages $50 a year, payable at the end of the year, provided he had not been arrested for making smoke. The result would be that he would pay such close attention to his fires as to save more than the $50 a year for his employer. He would get the $50 and the city would be benefited by the absence of smoke.

A public lecture was given by Mr. William J. Zimmerman, a lawyer of Milwaukee, on "The Public Right to Pure Air." He showed that a man has no more right to pollute the atmosphere with smoke than he has to pollute a stream of drinking water or to throw his garbage into his neighbor's garden. The emission of smoke is not only a misdemeanor, but it is the grossest kind of bad manners, which no gentleman should be guilty of.

The next meeting of the society will be in Cleveland. Charles P. Poethke, smoke inspector of Milwaukee, was elected president for the coming year and John Krause, smoke inspector of Cleveland, vice president; R. C. Harris, property commissioner of Toronto, Canada, is the secretary and treasurer.

ATLANTIC STEEL CO. RECORDS.

The Atlanta Steel Co., Atlanta, Ga., has recently been doing some exceptionally good work under J. A. Durfee, general manager, and Arthur W. Taylor, superintendent of the open-hearth department. In the latter, all previous records were broken during the month of June with the two furnaces, although there were five Sundays in the 30 day month and six days one furnace was shut down for repairs. The production was 4,292 gross tons. The daily records of the rod mill, blooming mill and hoop mill have also been broken a number of times. The spike mill is getting in good shape, and the wire and nail plant has always been in that condition. The company has just started a mine rail mill and is having no difficulty in disposing of its product. The announcement published in the newspapers of the erection of a blast furnace was not authorized, but it is probable that such an addition will be made in the not far distant future.

Strike is Ended.—The Cleveland yard of the American Ship Building Co. resumed operations on Monday in all of its departments, the striking unions having on Saturday voted to return to work. A committee from the unions met the superintendent of the yard on Sunday and agreed to the terms submitted by him. This practically ends the strike in so far as the yards of the American Ship Building Co. are concerned, the men at South Chicago, the last yard remaining out, having decided Tuesday to return to work.

During the six months just ended the Baldwin Locomotive Works turned out 1,334 locomotives, within four of the record for a half year established during the last half of 1906. For the entire year of 1906 the outturn was 2,250 locomotives.

TO BUILD BLAST FURNACES IN THE EAST.

The charter of the Connecticut Iron, Steel & Coke Co., Bridgeport, Conn., has been favorably reported on by the committee on incorporations of the Connecticut General Assembly. The company is capitalized at $1,000,000, with power to increase to $10,000,000. According to the charter, the corporation is empowered to do mining in Connecticut or elsewhere, of any and all kinds, and to manufacture any and all kinds of products of iron, steel or coke, and to construct and maintain tanks for the storage of crude oil for refining purposes. It may also lay pipe lines from these tanks to manufacturing plants. The company proposes to use southern and Cuban ore, bringing it to Bridgeport by water and smelting it in blast furnaces to be erected. Coke ovens are also to be erected, to be of the by-product type. Frank A. Wilmot, president of the American Tube & Stamping Co., Bridgeport, is largely interested.

STEEL RAIL CONFERENCE.

About fifty representatives of the steel rail manufacturing interests and the leading railways of the country were present, by invitation, at a conference on the rail situation held last Thursday in the offices of the United States Steel Corporation, 71 Broadway, New York. At its close the following statement was issued by E. H. Gary, chairman of the Corporation:

"The meeting was held to consider the character, quality and usage of steel rails. There were represented by president or vice president nearly all of the railroad systems of this country and Canada, and all of the manufacturers of rails of both countries. The importance of producing and using at all times a rail capable of meeting the requirements of traffic, however great, was recognized by all; and both the railroad officials and manufacturers discussed the various suggestions which have been made in that direction. The meeting was in every respect harmonious and friendly. It was decided to request the joint committee of experts heretofore appointed by the American Railway Association and the manufacturers of rails respectively, to report their conclusions for consideration at an adjourned meeting of the rail manufacturers and railroad officials at a time to be fixed by the chairman of the meeting. There seems to be no doubt that the manufacturers and purchasers will reach a conclusion that is mutually satisfactory to them and which will be approved by the public."

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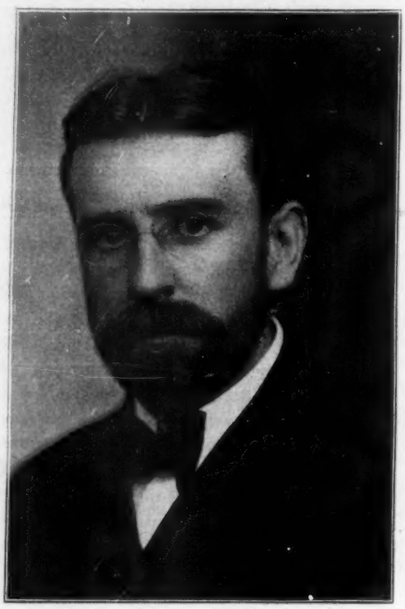

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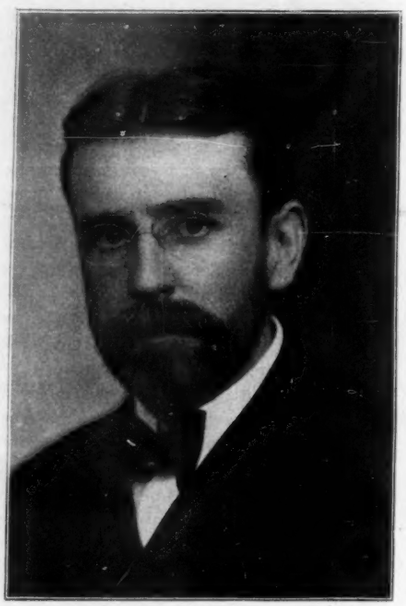

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Henry G. Bradlee has become a partner in the firm of Stone & Webster, engineers, Boston. The other members of the firm are Charles A. Stone, Edwin S. Webster and Russell Robb.

JAPS IN STEEL WORKS

Are Proving Very Satisfactory Workmen in Colorado.—Making Heavy Rails.

(Special Correspondence.)

Pueblo, June 29.—The Minnequa steel works and the various smelting concerns in Pueblo are not experiencing the trouble of former years in keeping their men at work during the summer season. While the steel works is employing more men than ever before, the officials are refusing employment to but very few applicants. Experienced workmen in the various departments are always in demand and the superintendents are always ready to give employment to skilled labor. The head of the Japanese colony reports that he now has about 500 men from the island here and more are expected shortly. The little brown men are very apt and learn the most intricate details of nearly all work in the different departments rapidly.

Ninety pound rails are being manufactured at the Minnequa plant for the first time, the work being started on them last week to fill a large order from the Union Pacific which will utilize the output of the local plant in laying a large portion of its tracks with heavier steel. Never before has the plant made heavier than eighty-five pound steel, but the works are equipped in every respect to put out anything in the way of steel or iron that any of the consolidated plants of the east can turn out, and there is not the slightest doubt but that they will turn them out successfully. The new rails, as fast as they can be delivered, will be used by the Union Pacific largely on its new line in Wyoming, and it is authoritatively stated that in the future all of its contracts will be for 90-pound steel, both in reconstruction work and in making extensions. Officials at the plant are more than pleased with the first run.

The sum of $150,000 was paid to the workmen at Minnequa last week, which is $12,500 more than was distributed in the preceding payroll. Employes at the plant are getting in full time unless compelled to be away by sickness or accident. Conservatively estimated, there is at present enough work on hand to keep the plant running at its average output for the next two years, and new work is accumulating all the while with such rapidity that it is believed that extensive improvements will be made as soon as possible which will increase the capacity to some extent. Visits by numerous officials of high standing recently have caused considerable comment.

CARNEGIE STEEL CO. BUILDS WIRELESS TOWERS.

The Carnegie Steel Co. has gone into a new branch of the steel business and has just shipped to Alaska for the United States government two transmission towers for wireless telegraph service.

It is ultimately the purpose of the government to have a chain of these towers along both the Atlantic and Pacific coasts and along the Gulf of Mexico, but the towers just shipped are the first to be erected. They are each 176 ft. high, 28 ft. square at the base, 4 ft. square at the top, and each weighs 22 tons.

The corners of the towers are constructed with 6 x 6 x 9-16 in. angles and the diagonal braces are made of 2½ x 2½ x 5-16 in. angles. The construction work was done at the fitting shop of the Upper Union mill, Pittsburg.

This is not the first time the Carnegie Steel Co. has gone into construction work, as several years ago it built 12 oil rigs, ten for the West Penn Oil Co. in the Virginia fields and two for the Carnegie Natural Gas Co.

New Firm Launched.—The Lees-Williams Co. has been incorporated under the laws of Pennsylvania, with an authorized capital of $5,000. The company has offices at 637-9 Wabash Terminal building, Pittsburg, and carries in Pittsburg a stock of Shelby seamless steel tubing, in all standard sizes and gages. Light machinery, tools and manufacturing specialties, including principally portable electrical drills and grinders, are also carried, as well as Shelby seamless trolley poles for electric cars. The stockholders are George E. Lees, for the past two years with the Shelby Steel Tube Co. as chief of the order department; Harold E. Williams, recently a salesman with the Chicago office of the National Tube Co., and Daniel Lees, of McKeesport. The incorporators are young men of thorough business training and adequate experience, and under their control the company has succeeded in building up a profitable trade even during the first few weeks of its activity.

The Baltimore Steel Car & Foundry Co. has been awarded the contract to build 1,000 stock cars for the Mather Stock Car Co., Chicago. The company is now building in the neighborhood of 4,000 cars of various descriptions for a number of railroads, including the Atlantic Coast Line railway, Fairmont & Somerset Equipment Co., Atlantic & Western railway and Seaboard Air Line Railway Co.

LABOR CONDITIONS

Remain Unsettled in Northwest—Guarding Against Coal Famine—Industrial News.

(Special Correspondence.)

Seattle, Wash., June 29.—The labor situation in and about Spokane, Wash., is still unsettled. The molders employed at the Union Iron Works at Spokane recently went on a strike demanding an eight-hour day with no decrease in wages. The present scale for molders is $3.75 for nine hours; for machinists it is 40 to 45 cents an hour. Non-union men have been imported from the east to fill the strikers' places; these men are working for the old rate of wages. The plant is operating with about a three-fourths crew; no violence or disturbances are experienced and the business is proceeding without interruption. The situation at the Union Iron Works is only typical of that throughout the Inland Empire region; the strike was a general movement which affected all the foundries operating in the vicinity.

Throughout the north coast cities the manufacturers' associations are already taking steps to prevent, if possible, the repetition of the disastrous coal famine of the past winter. In many places along the north Pacific coast last winter, suitable fuel for industrial purposes could not be had for any price; steam coal was particularly scarce. Every effort is being made to prevent the recurrence of these conditions but so far little hope is held out for any immediate improvement in the situation. There are practically no stocks on hand; the mines are running short handed and soft coal is selling for $8.50 a ton in Seattle, only 30 miles from some of the richest coal mines in the state. The United States government is paying $3.30 for coal that was purchased a year ago for $2.60. If another coal shortage like the one of last winter is repeated, the industries of Washington and the north coast country will experience a severe set-back.

The Union Iron Works of Spokane has recently completed a new foundry. The building is 90 by 172 feet, constructed of brick and entirely fire proof. The foundry will use 1,200 tons of pig iron per annum. For the two cupolas, which were designed by H. E. MacCamy, superintendent, and built at the Union Iron Works, a melting ratio of one to twelve is claimed.

The Spokane Harvester Co., a new concern composed mainly of local capitalists, has been recently incorporated for the manufacture of harvesting and agricultural machinery. Its plant, which is now under construction at Spokane, Wash., will contain a foundry 90 by 130 feet, and also a machine shop and wood working shop, uniform in size with the foundry. C. Lewis is manager.

The city of Spokane is about to construct a new steel bridge over the Spokane river at Washington street. The structure will be 1,200 feet long with a 48-foot roadway and will cost $386,000. The city engineer, Charles McIntyre, has also completed estimates and specifications for four reinforced concrete bridges to cost in the aggregate $680,000, and for one steel girder bridge at a cost of $9,900.

Plans and specifications for the construction of the new $1,500,000 dry-dock at the Puget Sound navy yard at Bremerton, near Seattle, have been forwarded to the bidders. The construction of this new dock means not only an increase of dry dock facilities but a general enlargement of the navy yard plant including a new foundry and machine shop.

LARGEST IN HISTORY

Were Earnings and Output of American Car & Foundry Co. During Past Year.

All high marks, both for the magnitude of its output and for its earnings, were eclipsed by the American Car & Foundry Co. in the fiscal year which ended April 30, 1907. This record was established in the face of delays in securing raw material which were encountered throughout the year. The company's income account compares with those of the two previous years as follows:

	1907.	1906.	1905.
Total earnings	$11,115,087	$ 5,648,553	$ 3,754,274
Repairs, etc.	1,768,003	1,490,103	818,789
Net	$ 9,347,084	$ 4,158,450	$ 2,935,485
New construction charged off, insurance, res.	1,207,548	350,790	307,367
Bal. avail. for div.	$ 8,139,536	$ 3,807,660	$ 2,628,118
Pfd. divs..	2,100,000	2,450,000	2,100,000
Balance .	$ 6,039,536	$ 1,357,660	$ 528,118
Com. divs..	600,000	.....	.....
Surp. for year	$ 5,439,536	$ 1,357,660	$ 528,118
Prev. surp.	14,113,049	12,755,434	12,327,316
Total surp. ..	$19,552,630	$14,113,094	$12,755,434

The gross business of the company for the year of 1907 aggregated $100,006,296, against, $69,040,638 the previous year, an increase of $30,965,658. The general balance sheet as of April 30, shows assets of $104,185,405, compared with $94,451,430 at the close of the previous year. Of the total assets $62,551,510 represented cost of property; $844,337, stocks and bonds in other companies; $19,002,795, material on hand; $18,464,543, accounts and notes receivable; and $3,322,309, cash. The statistics of the production of the company's shops, of the cars under contract, and of other interesting facts regarding its operations are as follows:

	1907.	1906.	Increase.
Cars contracted....	72,783	71,369	1,414
Men employed	25,409	23,807	1,602
No. pf. stkholds...	5,928	5,234	694
No. com. stkholds..	1,980	1,814	166
No. car wheels....	1,005,486	940,551	64,935
Tons cast iron pipe	20,500	20,763	*263
Tons gray casts....	76,073	64,864	11,219
Tons bar iron.....	220,256	207,612	12,644
Tons pig iron.....	18,858	22,000	*3,142
Wooden freight cars constructed	46,376	38,239	8,137
Steel freight cars constructed	47,485	34,518	12,967
Wooden pass. cars constructed	697	564	133
Steel pass. cars constructed	329	219	110

*Decrease.

New St. Louis Plant.

"The principal expenditure for the year has been the building and completion of the steel car plant in St. Louis, which is now in operation," said President Frederick H. Eaton, in his report. "This is the sixth steel car plant that the company now has, the first having been constructed about five years ago, and does not include the plant that was completed three years ago for building all-steel passenger cars, on which style of cars the company enjoys valuable patents, having been the pioneer in this line.

"There has been no time during the past year that the company could not have made delivery of a large number of cars of any class or description within three months from the date of the order, provided it had been possible to secure material in time for its requirements. The result has been that, although the output has increased over 30 per cent from the previous year, there is no doubt whatever that we could have constructed at least 25 per cent more cars if these conditions had not prevailed.

"Although at the close of our business year the amount of work on our books exceeded that of any previous year, we are now in excellent position, through the increased capacity of some of our plants, to make deliveries of a goodly number of cars yet this year. The business conditions are satisfactory."

At the annual meeting of the shareholders of the company, A. Barton Hepburn, of New York, was elected a member of the directorate to succeed Walter J. McBride, resigned. The other retiring directors were re-elected. At a subsequent meeting of the board of directors, William H. Hager, formerly assistant secretary, was elected secretary to succeed D. A. Bixby; Clarence Price was elected a vice president and the other officers were re-elected. The company's executive committee is composed of Frederick H. Eaton, C. R. Woodin and H. R. Dural.

HARNESSING TIDES

For Power Purposes.—A Unique Enterprise.—New England News.

(Special Correspondence.)

Worchester, Mass., July 1.—An enterprise is under way at South Thomaston, Me., which if it proves successful, will be an epoch-making event. A basin with an area of a little over one square mile is being used for the harnessing of the tides. There is a twelve foot rise in the tide at this point, by which it is intended to compress the air between the upper mechanism or platform and the water. It is expected to develop about 5,000 horse power, the compressed air to be delivered through pipes anywhere within a radius of twenty miles. The experiment is being closely watched.

A liquidating committee consisting of H. S. Burrage, T. F. Baxter, W. W. Whitmarsh and E. P. Belemy has been appointed to close the affairs of the Putnam Nail Co., Neponset, Mass., and the company's plant has been placed on the market. It comprises twelve acres of land and twenty-two buildings, a central power station and a gasometer. The property is on tide water.

An electric crane of a capacity of thirty-six tons has been added to the freight yard facilities of the N. Y. N. H. & H. Railroad Co., at Boston. It is said there is nothing this side of Pittsburg equal to this crane. It weighs ninety-seven tons, and will lift a whole load from a car at once if necessary, placing on the ground for reloading on drays, or will place on the drays if required. The crane commands two tracks for two hundred feet and a paved area of same length and thirty feet wide. It can handle the freight on ten cars without changing the position of the cars.

The Union Metallic Cartridge Co., Bridgeport, Conn., has taken out permits for the two remaining buildings in its scheme of new construction. One of the factories will be three stories high and will cost about $75,000; the other will be four stories, costing $55,000. Both buildings will be of brick.

Joseph E. Knox & Co., Lynn, Mass., are building a factory for the manufacture of dies of all kinds.

SIGNS DEMURRAGE BILL.

The New Jersey demurrage bill, which regulates demurrage charges and prohibits railroads from charging for delay in unloading goods until two days have expired from the time a car has been placed in position for unloading, has been signed by Governor Stokes.

INCREASED PROFITS

Realized by United States Cast Iron Pipe & Foundry Co. in Fiscal Year.

An increase in profits of $56,843 over that of the previous year was realized by the United States Cast Iron Pipe & Foundry Co. from its operations for the year ended May 31, 1907, a full report of which has been issued. The total surplus of the company now stands at $944,259, compared with $873,523 a year ago, an increase of $70,736. The income account for 1907 and 1906 compares as follows:

	1907.	1906.
Total increase	$2,112,051	$2,053,208
Int., resv., etc.	299,000	297,000
Profits for year	$1,813,051	$1,756,208
Prd. divs.	875,000	1,000,000
Balance	$ 938,051	$ 756,208
Com. divs.	500,000	375,000
Surplus	$ 438,051	$ 381,208
Prev. surp.	506,208	492,315
Total sur.	$ 944,259	$ 873,523
Res. for work cap., imp., etc.	312,458	367,315
Profit and loss surplus	$ 631,801	$ 506,208

The general balance sheet, as of May 31, 1907, shows total assets of $31,240,844, compared with $30,494,354, in 1906, an increase of $746,490.

Exceeds Banner Year.

President Hayes in his annual report says in part to the stockholders:

I am glad to say that you will find that the net profits of the company are in excess of those of last year. This is so notwithstanding the fact that the year 1906 was our banner year, and not withstanding the further fact that during the year just closed there has been a sharp increase in the price of labor and raw material.

During the year the company has built a new foundry at Chattanooga, a complete new foundry at Scottdale, near Pittsburg, which will double the capacity of that plant in pipe, and a large foundry and power house at Burlington. The extensions at these three plants will result in a material increase in the manufacturing capacity of the company, and also a reduction of the cost of manufacture. All of these expensive additions to the plant facilities of the company have been paid out of earnings and the net profits shown by the accounts at the end of the fiscal year are made after deducting the cost of these extensions. In addition to the expenditure for the foregoing purposes, all of the plants of the company have been kept in first-class condition. This latter cost has been charged as a part of the cost of manufacture.

You will observe from looking at the report that notwithstanding the increase in the company's manufacturing capacity the plant account remains the same. Your directors have thus avoided capitalizing disbursements, which would be properly chargable to the plant account. The company has not borrowed a dollar for the past three years. It has ample working capital to finance all of its necessities. It owes no money of any kind except for current accounts.

We make no predictions for the future, but feel assured that with our increased capacity and the harmonious co-operation of employes and management, the company is in better condition today than it has been since its organization.

At the annual meeting of the stockholders, all the present officers of the company were re-elected.

LARGE EXPENDITURES

Will be Made in Important Improvements on the Pacific Coast.

(Special Correspondence.)

San Francisco, June 26.—Several extensive jobs are in contemplation in California which will require the work of thousands of mechanics and laborers for the next three years, in addition to those employed on the ordinary work in the local shops. The Southern Pacific Co. has perfected plans for an oil pipe line from Bakersfield to Port Coast, on the Bay of San Francisco, a distance of 282 miles, in competition with the Standard Oil Co. The contracts for the preliminary work on that system were let about four weeks ago. The system will have 23 stations, each to be equipped with four Dow pumps and four large water-tube boilers of the Elsemere type. The four pumps to be installed in each unit are of special design for the handling of oil. The line will be constructed of 8-inch rifled oil pipe. The system for pumping oil has been thoroughly tested and developed after much experimenting. Water is first pumped through the pipes, lubricating them, which is followed up with oil. The swirling action is imparted to the water by the rifling in the pipe, which makes the water cling to the inner surface, thus lubricating it and preventing the asphaltum contained in the oil from clinging to the inner surface and clogging the pipes. The work will require an outlay of fully $2,500,000.

A more extensive work and one involving the expenditure of more millions, is the conversion of the suburban steam railway system into an electric one of the most modern type. This change, though calling for very large expeditures, is merely incidental to one of greater magnitude. The Southern Pacific, since the government has granted the right to construct a railroad bridge across Dumbarton Point, will change its system along the shore, and construct a new line from Dumbarton to San Francisco, 28 miles, running all its trains, passenger and freight, into the city, without ferrying them across from the Alameda shore. Work on the bridge has already been commenced, and the work is to be pushed rapidly to completion. New and commodious passenger boats are to replace the present ferry boats between San Francisco, Oakland and Alameda.

Harnessing the mountain streams of California and Nevada is an enterprise which is expected to develop almost unlimited power by which to move the wheels of industry in and about San Francisco. A company with ample capital has been organized, the land surveyed, and engineers are perfecting plans for that gigantic enterprise.

The foundries, ship building plants and shops are all running, but they are not fully manned, and some departments are sadly crippled owing to lack of men. Between 2,000 and 3,000 mechanics in the metal trades have left San Francisco during the strike, and found employment in other places. They are returning, though gradually and slowly, and there is room for a large number of mechanics in that line. The absentees who have written to their respective unions for clearance cards almost invariably volunteer the information that they expect to return in time, but they are needed here right now, and would readily find employment at higher wages than they receive in the east.

NEW RAILROAD SHOPS.

The Baltimore & Ohio Railroad Co. has had plans prepared for the construction of additional shop buildings at Washington to be used in connection with the new union terminal now nearing completion. The buildings include a four-story brick, steel and reinforced concrete fireproof store-house, 50 x 200 feet; a brick, steel and reinforced concrete power house, 65 x 95 feet; a brick oil house, 21 x 50 feet; a steel carpet-cleaning shed, 25 x 60 feet, and three airing sheds, each 300 feet long.

The Sligo Iron & Steel Co., Connellsville, Pa., has filed a bill in equity against the Amalgamated Association of Iron, Steel & Tin Plate Workers and local unions charging the organizations with threatening to blow up the houses in which the men willing to work were living and with threatening the life of the superintendent.

EMINENT MEN OF THE IRON WORLD

FRANK J. HEARNE.

By W. B. Robinson.

In the general iron and steel world,—and it is a world by itself,—comparatively few persons knew Frank J. Hearne intimately; by this we mean knew him through close personal relations, knew what was in his mind, and knew what he was next going to take up or what his plans for the future were until he had actually had them under way or accomplished or at least had worked them out to such a degree that there was no chance of their not being carried through.

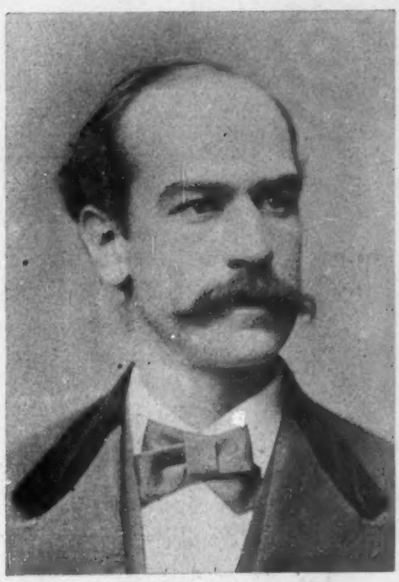
He was a general, an organizer, and a pioneer, a man with a thorough technical knowledge of his business, an engineer, and a man who worked out his projects in an original and independent manner, a man who relied upon his own opinions and projects and at the same time directed the entire result of his efforts into channels that brought prestige and profit to those with whom he was associated.

In early life his endeavors were far separated from those in which he later won distinction and renown. He was born at Cambridge, Md., the son of the late William L. Hearn and Marie Elizabeth Hearn, Sept. 21, 1846, the parents having moved from Laurel, Md., the home place of the American branch of the Hearne family, some time previous. During Frank J. Hearne's childhood, the family moved again, this time to Missouri, where he received the rudiments of learning and when, in 1860, the father moved to Brooklyn, N. Y., Frank attended Columbia College and later received a technical and civil engineering education at Rennsallaer Institute, Troy, N. Y.

His natural forte was engineering and the first important step in his active life was to accept a position as civil engineer on construction work on the Hannibal & St. Joseph railroad in Missouri, serving under his brother-in-law, General Geo. H. Nettleton, of Kansas City, then chief engineer to the road. The natural aptitude shown for this work brought him rapid advance and recognition and the crowning feat of his connection with the railroad was the construction of the great bridge across the Mississippi River at Quincy, Ill., this being accomplished along what at that time were daring and original lines, the great span being erected without interrupting train traffic. This was considered an engineering triumph, and brought Hearne to the fore-front of his chosen profession.

Early Successes.

In the meantime William L. Hearn, the father, became manager of Dewey, Vance & Co., which later was known as the Riverside Iron Works, at Wheeling, W. Va., and, recognizing the adaptibility of his son to engineering work, sought



Frank J. Hearne When He First Went to Wheeling,—1875.

to have him take a position with the Riverside Iron Works and make Wheeling his home, in order that he might cooperate in the iron business and secure a wider range of endeavor. The change came about in 1874 when Frank J. Hearne went to Wheeling as assistant to his father and at once the exceptional executive ability and foresight of the younger Hearne became apparent and gradually he assumed the duties of his father, who in 1880 retired and left the plant in charge of the future president of the Colorado Fuel & Iron Co., Hearne remaining in the position until the company was absorbed by the National Tube Co. and later became a constituent company of the United States Steel Corporation. At the time of the consolidation in 1899, Mr. Hearne was elected first vice president of the National Tube Co. with headquarters in Pittsburg and later, upon the retirement of President Converse, succeeded him, continuing in this position until 1902, when he expressed a desire to retire, and did so.

Upon assuming the duties of general manager of the Riverside Iron Works at Wheeling, he at once became a leader in the manufacture of iron and steel. His progressive personality became stamped upon the institution and, one after another, changes and improvements were made. Here again was shown another of Hearne's characteristics. He not only thought out and suggested new ideas himself, but he was a careful observer and watchful of developments along similar lines elsewhere. He was a pioneer in his work in his particular district and was always in advance of the procession.

Making Soft Steel.

As is the case with many new departures from existing practice, the manufacture of soft steel, in which Mr. Hearne was the pioneer, came about through a very unpleasant situation due to the big puddlers' strike in the Pittsburg and Wheeling districts in 1882. At this time the Pittsburg and Wheeling iron makers had entered into an agreement to stand together and fight the demands of the union puddlers, Wheeling being particularly interested on account of the extra 25 cents per ton demanded by members of the union on the ground that Wheeling coal contained more sulphur and therefore necessitated greater amount of work and skill at the puddling furnaces. After a great deal of negotiation on both sides, the Pittsburg interests deserted the Wheeling operators, settled with the union and left Wheeling with the extra 25 cents per ton extra puddling charges, which became a great handicap inasmuch as it increased the cost of production to that extent and he (Mr. Hearne) fought the union to a standstill. He conceived the idea of substituting soft steel for iron, went to Pittsburg and secured a supply of steel billets, and rolled them into sheets at Wheeling and demonstrated to his own satisfaction that cut nails could be manufactured from steel

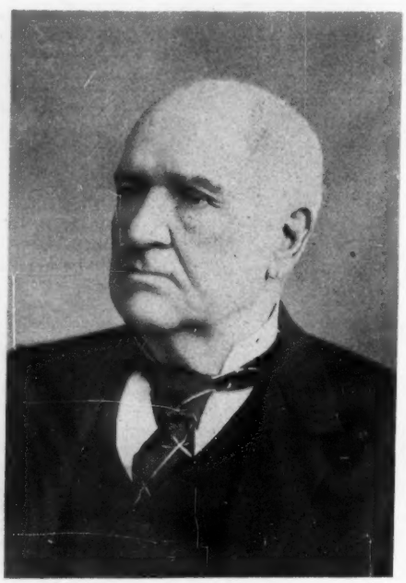
more cheaply than from iron. Mr. Hearne proposed to the various manufacturers of finished iron products in the Wheeling district that they cooperate in the erection of a steel-making plant large enough to meet the requirements of all, and here again he was too far in advance of his time, and the other manufacturers, either on account of jealousy or business rivalry, would not enter into the project, the result being that the Riverside Iron Works proceeded with the erection of its own steel plant. Within a very short time, the wisdom of the move was demonstrated, those who had previously refused to participate in the innovation quickly fell into line, before long trailing behind, and had their own steel plants.

The Nailers' Strike.

A few years later, the big nailers' strike was declared in the Wheeling district. The steel plant of the Riverside Iron Works at the time of the nailers' strike had been in operation about a year; the company immediately went into the manufacture of steel nails, having decided to abandon iron cut nails entirely and devoted itself to the manufacture of the new product. Mr. Hearne's course was bitterly fought by all nail makers in the country and it was the favorite practice of salesmen for other interests to carry with them a pocketful of Hearne's new product to demonstrate to the trade their impracticability and explain at the same time that on account of their brittleness a blow from the hammer would knock off the head. Mr. Hearne continued their manufacture, however, and soon came into control of the market. The nail mill did not have sufficient capacity to take care of the steel works' production and Mr. Hearne was compelled to find a market for his surplus steel. He went to Pittsburg and saw officials of the Jones & Laughlin Steel Co. and the Oliver interests and sold them steel billets before they were in the steel business themselves. Later the Riverside directors saw Thomas Bray, father of the present president of the American Sheet & Tin Plate Co. and also T. J. Bray, now vice president and chief engineer of the Republic Iron & Steel Co., the elder Bray at that time being with the old Pittsburg Tube Co. on Second avenue, Pittsburg, afterwards a department of the National Tube Co. and employed Mr. Bray to build a merchant iron pipe mill in connection with the Riverside Iron Works at Wheeling. Later, in experimenting, he found steel so much superior to iron that it was permanently adopted for the manufacture of pipe.

Some Obstacles.

Prior to this time, all boiler tubes had been manufactured from charcoal iron and all merchant pipe from puddled iron skelp. The greatest handicap he met in the sale of his merchant steel pipe came from jobbers and consumers, who complained they could not machine the pipe on account of its hardness, but he overcame these prejudices by pointing out that the objection lay not in the material itself but in the methods used and that it could readily be cut and threaded if the proper kinds of tools were used. Although the manufacture of steel pipe began about 1888, it was not until the early 90's that it became an eminent success and with this success the Riverside Iron Works gained the reputation held by none of its competitors, spread out and extended under Hearne's guidance, demonstrating without a doubt his early assertion that steel pipe could be manufactured more cheaply and a better quality produced, aside from opening new avenues for its use, than had been open to wrought iron pipe, the truth of this claim being shown by the overwhelming preponderence of steel tonnage as compared with wrought iron tonnage from that time forward.



MR. HEARNE'S FATHER, WILLIAM L. HEARN.

Every mill in the country fought Mr. Hearne and his Wheeling product, but the fact remains that his mill was kept in continual operation and his product sold when iron pipe mills were compelled to shut down for want of business.

A story is told in connection with the meeting of the Pipe Association about 1890. Mr. Hearne attended this meeting and was met with an avalanche of protests from other pipe makers to the effect that several of his salesmen had gone through the New England states slashing prices right and left and, as one of the manufacturers at that meeting expressed it, left a trail of blood behind them. His reply was characteristic when he said, "There may be a trail of blood through New England, but it is not my blood."

Stock Value Increased.

Probably the highest testimonial to the ability of Mr. Hearne was furnished when the deal by which the Riverside Iron Works became a part of the National Tube Co. was closed. The stock of the Wheeling concern was purchased at 46 cents on the dollar more than was paid for the stock of any other concern entering into the agreement, the highest price paid up to that time being 170. At the time Frank J. Hearne first became connected with the Riverside Iron Co., its stock was selling around 70 and when the plant was merged into the big company its stockholders were paid 216½.

Wheeling now looks upon Col. Frank J. Hearne—he secured his title by appointment on the staff of Gov. Atkinson, of West Virginia, 1896-1900—as one of the great leaders of its many industries and the city honors and reveres his memory to such an extent at the time of his death, Feb. 25, 1907, many of its leading citizens took it as an affront that his remains were taken to Kansas City, instead of to his former home and scenes of his first great success, for interment. The people of Wheeling feel that he belongs to their city and that this should be his final resting place.

Col. Hearne was not demonstrative; he never expressed an opinion or advanced an idea until he had thoroughly worked the problem out in his own mind and, this once done, any project under consideration was pushed unfalteringly to completion. He was a sharp, shrewd business man; he had a wonderful faculty of determining the interests of those he represented, and he never did anything that smacked of trickery. He was outspoken; said what he meant, just as he thought it, regardless of whom it affected, but on the other hand he was tender in his feelings and warm hearted as a woman to his friends. He did more for Wheeling, W. Va., than any man who was ever in that city and intended that the Riverside Iron

Works should be his life work and monument and it was circumstance more than intention that led him away.

Labor Troubles.

There was a time when the workmen of Wheeling were against him, when they regarded him as their sworn enemy. This was during the labor troubles. Col. Hearne had his own idea about labor unions and their usefulness. He did not oppose organized labor as a matter of principle, but he did oppose it as the dominant feature of a manufacturing establishment and he fought dictation by labor leaders. During his big fight against domination of labor unions, the feeling in Wheeling against him was bitter and vindictive; even went to the extreme when Col. Hearne received anonymous letters threatening his life, but he disregarded them and pursued his policy of not discriminating against a workman because he belonged to the union, but carefully avoiding the possibility of their securing a majority among his employes and gaining a position where they might be able to control the situation.

Another of Col. Hearne's struggles with labor organizations took place a few months after assuming control of the Colorado interests. John Mitchell, president of the Coal Miners' union, determined to organize the miners of Colorado and as the biggest interest the Colorado Fuel & Iron Co., had Mr. Mitchell's efforts succeeded, would have been compelled to bear the greater part of the burden. President Mitchell sought an interview with Col. Hearne, but the latter refused to see him, pointing out that, as the leader of the coal miners of the United States was not in his employ and as the Colorado Fuel & Iron Co. was in no way interested in his project, there was nothing in common that would make a conference necessary or beneficial to their interests and Mr. Mitchell never saw Col. Hearne.

His Colorado Record.

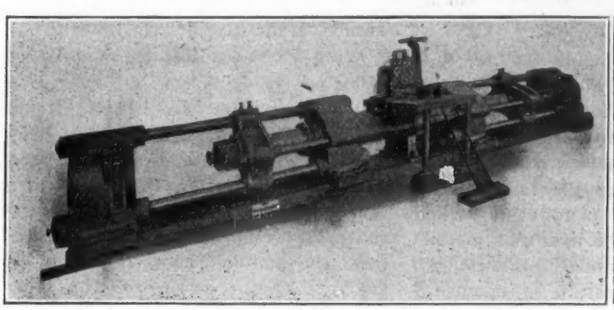
After retiring from the presidency of the National Tube Co., with the determination to take a rest, he remained inactive less than a year. Then E. W. Oglebay, of Cleveland, a director and stockholder in the Colorado Fuel & Iron Co. and a friend of Col. Hearne, began to talk to him upon the possibilities and resources of the company. He called the attention of Geo. J. Gould to Mr. Hearne and his constructive and executive ability, and pointed him out as the man to take charge of the company's interests in Colorado. Before he would consider the proposition, Hearne went to Colorado, looked over the plant, found it loose jointed and badly in need of harmonizing and system. After his year of inactivity, he was also anxious to return to work and entered into an agreement with Mr. Gould to assume the presidency of the Colorado Fuel & Iron Co. for five years, with the understanding that he should have a free hand and all the money he wanted for developments and construction. John D. Rockefeller Jr. and a Gould representative visited Colorado and agreed. It is now a matter of history that within a few days after assuming control he wired for $1,000,000. The money was sent and afterwards and during the management of Col. Hearne $12,000,000 more. It is said of Col. Hearne that in building or developing he never exceeded his estimate or ran past the date set for completion, this probably because he made his estimates large enough at the beginning. He never took chances in the ordinary sense of taking chances. He was sure of himself and always succeeded, but many of his undertakings were wide chances in the estimation of associates, and with another man many of his projects would have been extremely hazardous.

MODERN MACHINERY IN GERMAN STEEL PLANTS.

BY FRANK C. PERKINS.

While the up-to-date iron and steel works in Germany and other European countries, as well as in America, utilize electric power extensively, there are many operations requiring very heavy tools which can be operated to better advantage by hydraulic and steam power than by electric power. The accompanying illustration, Fig. 1, shows a double horizontal draw press with accumulator as constructed at Kalk, near Cologne, Germany, at the works of Breuer, Schumacher & Co., Ltd.

A hollow cast iron bed plate carries the cylinder and tool holders of two presses which work alternately. The cast steel cylinders are accurately fitted into the cast iron cylinder holders. The tool holders at each end of the bed and the cylinder holder are connected by two wrought steel horizontal bolts in order to take the stress of the bed plate. The cross heads, which are connected to the rams, are guided in brass bushings on these bolts. The cross heads carry in their front sides bearings for the draw rods which can be shifted 30 degrees out of the center in order to clear the work. The valve gear which is placed in the center of the press in quadruple, is worked by hand and so arranged that the admission valve to one cylinder is always open when the exhaust valve to the other opens. The water in this way operates in both presses simultaneously, and through a cross head and rods connected to the extended ram, forces it back to its horizontal position. This draw press, having a stroke of



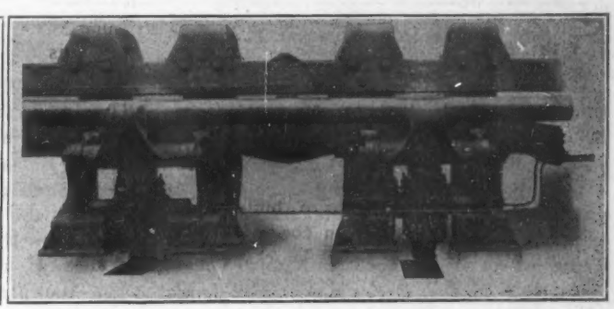


FIG. 1.—GERMAN DOUBLE HORIZONTAL HYDRAULIC DRAW PRESS. FIG. 2.—HYDRAULIC KEEL PLATE BENDING AND FLANGING MACHINE.

103 inches, operates under a hydraulic pressure of 300 tons.

The illustration, Fig. 3 shows a combined steam hydraulic hammer also constructed at Kalk, near Cologne, which weighs 79,000 pounds. and operates under a pressure of 400 tons. It has a stroke of from 4 to 19 inches and the gap of 35 inches.

Two other interesting German tools extensively used in iron works are the steam hydraulic forging press with steam drawing gear for making tires shown in Fig. 5 and the hydraulic flanging machine, shown in Fig. 6, of 300,000 pounds for flanging straight plate edges. This machine has an automatic return and the hollow frame which is provided with a gap has a vertical cast steel cylinder bolted to it above the bed and in front of the main cylinder. It has a tool attached to the lower end of the rod, which holds the work firmly on the rectangular table. A brass lined hydraulic cylinder is cast in the frame at an angle of 30 degrees, having a cast steel cover. The piston rod of the hydraulic cylinder has a suitable tool attached to its lower end, in guides, so that it can slide at right angles to its axis, when the tool guide is moved nearer or further from the table by means of a handwheel gearing and a screwed handle, the tool guide being on the lower side of the gap. Brass return stroke cylinders are bolted to the two hydraulic cylinders, the pistons of which are connected to the hydraulic pistons and are always under pressure, so that when the pressure is taken off the hydraulic pistons, the tools are at once drawn back. The valve gear is opened or shut by means of two hand levers.

The vertical hydraulic plate bending machine with pressure rollers illustrated in Fig. 4 has two cast steel uprights mounted on the hollow bed plate and connected at the top with one another by a cast steel girder. The cast steel pressure uprights are between the two fixed uprights and run on rolls on the bed plate and in guides in the top girders. They are provided respectively with concave and convex surfaces between which the plate is bent. Inclined faces are cast on the inside of the left hand upright, top and bottom, opposite which are placed vertical races on the movable pressure uprights, the latter being provided with two rollers. The two upper rollers run on steel bolts on the cross head, which is fastened to the piston rod of the hydraulic pressure piston, while the two lower rollers are connected to the cross head by heavy forged links. The hydraulic pressure cylinder is fastened to the left hand fixed upright, the piston rod carrying the cross head, so that when the cut-off hand lever which is fastened to the bed-plate is opened the piston rises, the rolls force the pressure uprights to one side and bend the plate. The rolls contact so as to take the strain off the bolts. In order to take out the plates which have been bent to a complete circle,

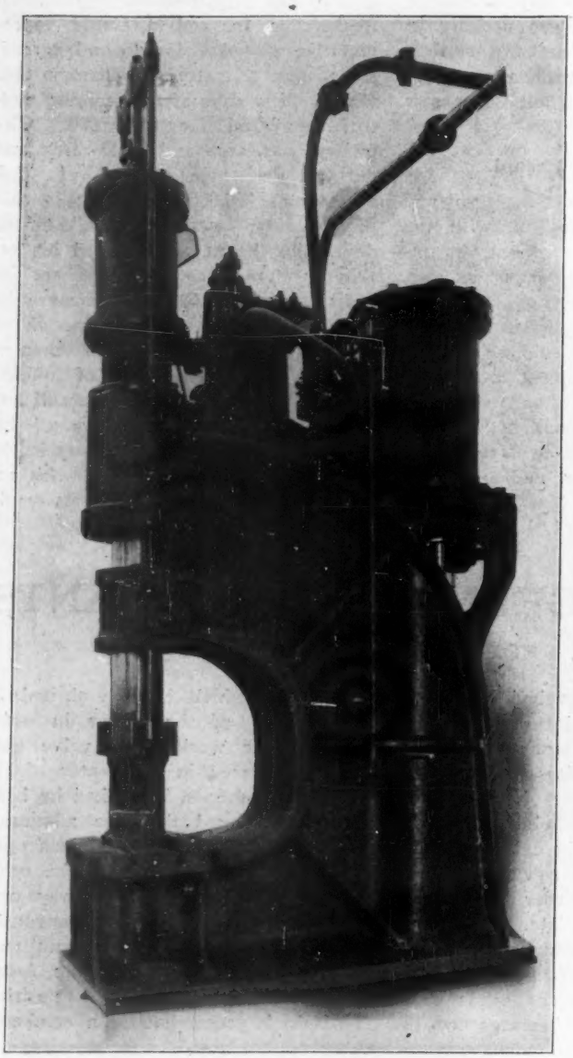


FIG. 3.—STEAM HYDRAULIC HAMMER.

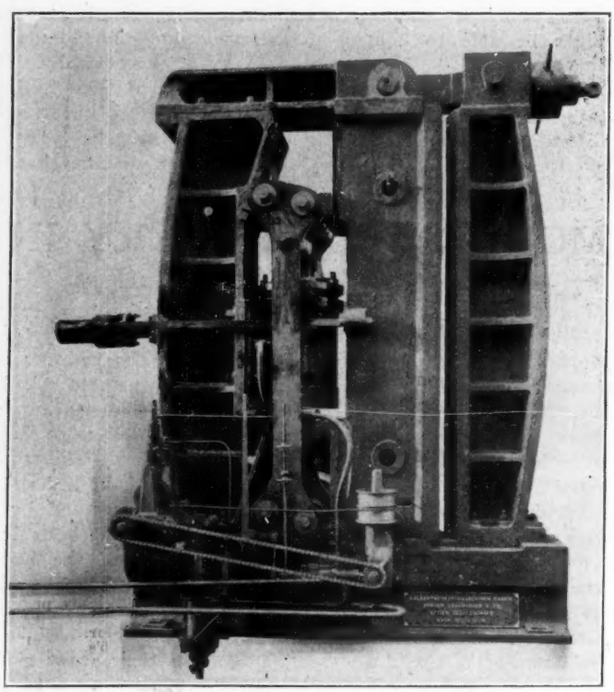


FIG. 4.—GERMAN VERTICAL HYDRAULIC PLATE BENDING MACHINE WITH PRESSURE ROLLERS.

the top girder is connected to the right hand upright by a hinged screw which can be lifted up out of the way when the nut is loosened.

A hydraulic draw-back cylinder is fixed to the left hand upright and connected by two connecting rods to the pressure uprights by means of which the machine can be brought back to its first position as soon as the plate has been bent. This cylinder is also put in action by the valve lever. Plate edges can also be bent by this machine so that they lie close together at the places where they will subsequently be riveted, rendering later adjustment unnecessary.

This vertical hydraulic plate bending machine weighs 66,000 pounds and takes plates having a width of 126 inches and a thickness up to 1½ inches. These machines are also constructed with automatic lifting arrangement for the hinge screw bolt and also an automatic movement of the plate after each stroke.

A most interesting type of horizontal plate bending machine is shown in Fig. 2 for double flanges. This hydraulic keel plate bending and flanging machine has a capacity for plates about 33 feet in length and up to 1¼ inches in thickness, its total weight being 352,000. The two double gap uprights of this machine are joined together above and below the gaps by longitudinal girders on which the plates are bent and flanged. Each double upright carries, in front of the middle, the bearings for an oscillating hydraulic cylinder, the pistons of which are provided with circular surfaces for the long bearings of the steel roll. A safety arrangement is provided to prevent the pistons rising too far. Hand worm gear is provided for setting the roll to suit the various thicknesses of plates. The plate to be bent is held in the machine by a wedge shaped block running in guides, which is actuated by a hand regulated hydraulic cylinder at the side of the machine. The roll can be evenly or unevenly raised by the two-hand regulated hydraulic cylinders so that a keel plate can be bent to any desired angle. With flat keel plates one side is first flanged, the plate turned round and the second flange bent. The illustration, Fig. 7, shows another type of flanging press of German construction operated by hydraulic power.

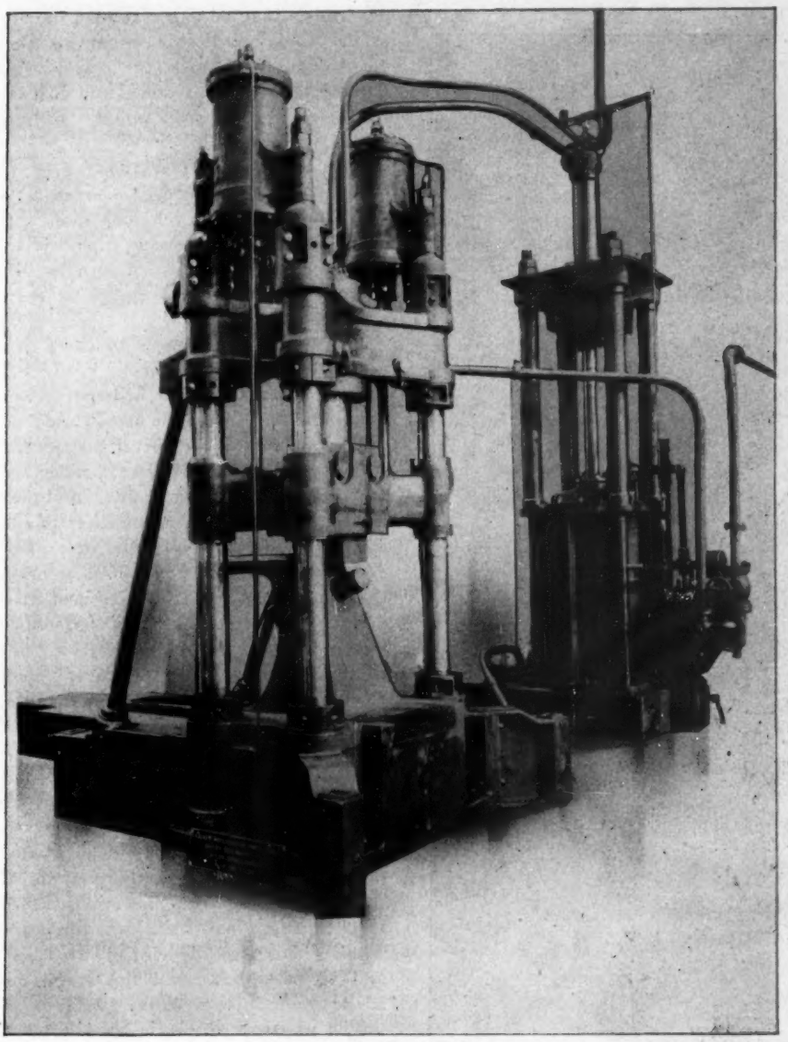


FIG. 5.—STEAM-HYDRAULIC FORGING PRESS WITH STEAM DRIVING GEAR FOR MAKING TIRES.

SHIP BUILDING CONDITIONS

Reflected by Poor Financial Showing of the Cramps Interests.

The poor showing of the Wm. Cramp & Sons' Ship & Engine Building Co. for the year ended April 30, 1907, is attributed by President Henry S. Grove in his annual statement to the stockholders to the extremely unsatisfactory condition of the shipbuilding industry on the Atlantic coast. During the year there were further advances in the cost of labor and material, thus practically eliminating the small margin that close competition compelled the company to accept. The I. P. Morris Co. had a busy and prosperous year, with more business offering in its water turbine and engineering works than it could undertake. The subsidiary companies and departments other than shipbuilding had a most successful year.

The income account of the company compares as follows:

	1907.	1906.	1905.
Net profits	$328,328	$704,724	$777,702
Fixed charges	324,920	333,752	463,537
Surplus	$ 3,408	$370,972	$314,165

The general balance sheet as of April 30 has total assets of $16,627,184. The report shows Harry W. Hand as vice president, he having been elected to the vice presidency to succeed Edwin S. Cramp, who resigned several months ago. At the annual meeting of the company the old board of directors was re-elected.

The advertising department of J. H. Hillman & Son, Pittsburg, dealers in pig iron, steel and coke, is sending out to customers a novelty envelope opener which can not fail to be useful.

The fire loss in the United States and Canada during May, 1907, amounted to $16,286,300.

MECHANICAL EXPERIENCES WITH LIMBER AND STIFF RAIL SECTIONS[1]

BY P. H. DUDLEY

I made a brief comparison of the mechanical properties of different sections in a preceding paper, presented to this society, indicating that the stiffer rail sections could and would carry larger bending moments in distributing the wheel loads and generated wheel effects of the passing locomotives and cars, to the cross-ties, ballast and road bed, than the weaker sections they replaced.

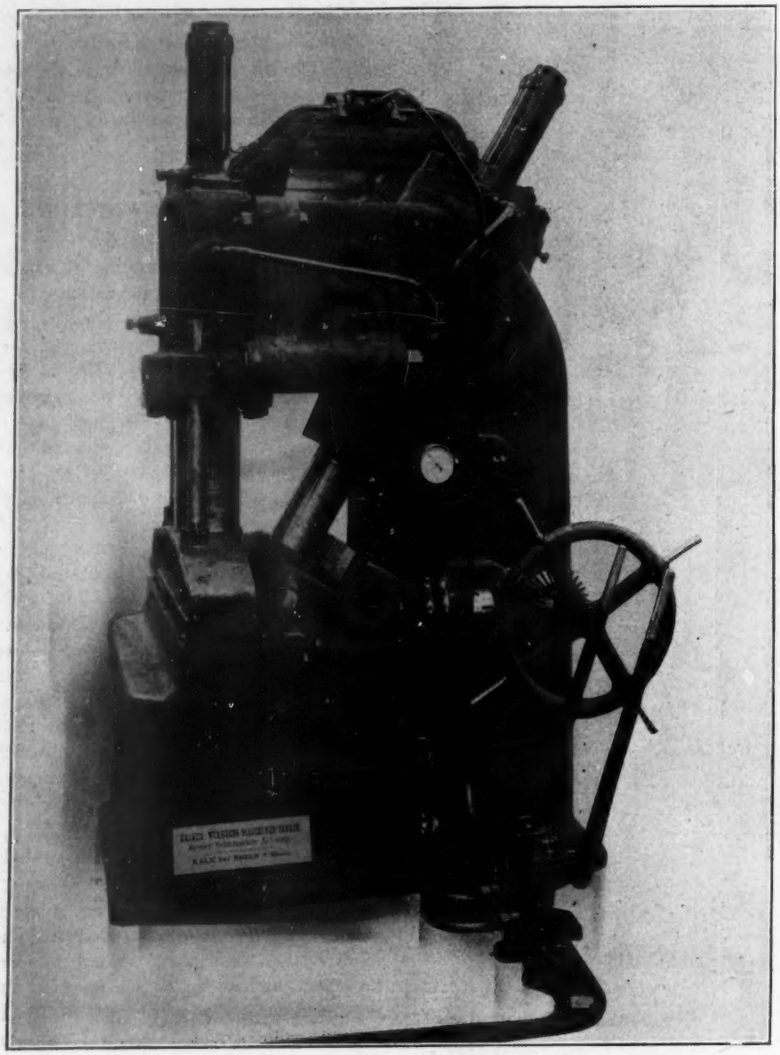


FIG. 6.—HYDRAULIC FLANGING MACHINE FOR FLANGING STRAIGHT PLATE EDGES.

The early limber steel rail sections of 3¼, 4, 4¼ and even those of 4½ inches height, 50 to 65 pounds per yard, distributed only a small percentage of the wheel effects to the wheel spacing, owing to their inadequate mechanical properties of stiffness and strength. The major portion of the wheel loads was concentrated in passing upon each cross-tie, which was cut rapidly in the rail seats, and disturbed the ballast and road bed.

Rail sections when well fished act as continuous girders in the track, and their efficiency increases with their mechanical properties, in supporting the moving locomotives and cars. They receive their loads for distribution only through the wheel contacts, and in the wheel bases their spacing limits the spans of the bending rails under the wheels, rather than that of the cross-ties.

The average generated kinetic effects of the rolling wheels on the limber rails, doubled or trebled their static loads, and this enhanced the destructive work upon the track, augmented the train resistance, and cost of maintenance of motive power, rolling stock and track.

The static wheel loads of the locomotives and cars did not increase sensibly over those developed upon the iron rails, owing to the inability to maintain the tracks as smooth as desired even under the weights as then constructed.

The design of sections to carry the locomotive and car wheels ½ to 1½ inches higher above the cross-ties than the limber rails, by the use of only 25 to 50 per cent more metal distributed to insure greater mechanical properties, for stiffer, stronger and smoother tracks, has enabled the wheel loads and expended tractive effort of the locomotives to more than double, upon the same road beds, in the past two decades. The first 100-ton passenger locomotive did not go into service until 1890, six years after the first 5-inch steel 80-pound rails were laid in 1884.

The strap iron rails in the thirties of 1800 were able only to establish locomotion for light wheel loads, and failed when they reached two and three tons, owing to the generated wheel effects in rolling over the irregular surfaces of the rails, and undulations of the track. The iron T-sections failed in the fifties and sixties, when the wheel loads had developed to 10,000 and 12,000 pounds and the speeds to 30 or 40 miles per hour.

The physical properties of the metal were inadequate, with its 1½ to 2 per cent of included slag and imperfect welding of the bars composing the pile, to prevent crushing and laminating in the bearing surface under the rolling wheel loads. The utmost care in manufacture, in England, Wales, or this country, could not make iron rails which would long endure heavy traffic. It was not carelessness, incompetence, or dishonesty of the iron masters, as often alleged, but the fact that the work required of the metal exceeded its physical properties, and fatigue, failure,

[1]A paper presented at the Atlantic City (June, 1907) meeting of the American Society for Testing Materials.

and fracture were the inevitable consequences after short service.

The operations of the railroads due to the commercial demands and development of transportation in thirty years after their inception, outgrew the physical properties to be obtained in iron rail sections as a metallurgical product in forms of values as engineering structures. The iron sections designed for larger mechanical properties as girders, for better track and smoother running of the locomotives and cars, from the larger bending moments carried and distributed with consequently greater intensity of the wheel contact pressures in the bearing surface, failed with greater rapidity than the former lower and weaker sections, under the same service. The heads of the T-rails were then made pear shaped, to prevent breaking down under the wheel loads, but this did not check the trouble. These were similar effects to those now experienced with piped and split rails under heavy wheel loads. The causes of the failure of the metal, either in the iron or the steel rails, were due to inadequate physical properties in either case, though in the latter due more to the association of impurities than Bessemer steel, when made from sound and solid ingots.

The failure of the iron rails to sustain the wheel loads in the bearing surface, and their failure as girders in distributing the loads to the cross-ties, was a subject of earnest solicitation to the railroad officials to find a substitute, and the Bessemer steel rails, fabricated from cast metal, were welcomed, and extensively used. Their cost for many years limited them to light and flexible sections, which permitted a deep general depression under the moving wheel bases of the motive power and equipment, with decided specific deflections under the wheels, and restricted the increase of loads and development of the locomotives and cars as required for progress in transportation. The flexible rails carried and distributed only small bending moments; the intensities of the wheel contact pressures per square inch were also small, and moderate physical properties in the steel were ample for the service and rendered a slow rate of wear. The positive bending moments under the wheels did not reach 200,000 inch-pounds over 10 or 12 times daily, while the estimated intensities of the pressure per square inch in the bearing surface were under 80,000 pounds from measurements of static loads.

To raise the bearing surface of the rails above the cross-ties ½ to 1½ inches higher than the limber sections, in the trackmen's surface, may seem small in the sense of dimensions, but when utilized in the design of sections of rails, with corresponding proportions of metal, the mechanical properties secured to carry and distribute heavier wheel loads, increased their capacity 50, 100 to 200 per cent in the different sections. The wheel loads and trains which have been developed and are running upon the stiffer rails have revolutionized transportation, so far as the capacities of the railroads are concerned. The gain due to the increased mechanical properties in the sections, saving destructive work to the cross-ties and road bed, can be secured only by a greater intensity of pressure under the wheel contacts, and increased work of the sections as girders to distribute their loads, for which proper provision must be made in the physical properties and soundness of the metal used.

The postive bending moments in the stiffer sections are 60 to 100 times daily over 600,000 inch-pounds, in some 100-pound rails under the heavier wheel loads and high speed trains. The percentage of the wheel loads distributed to the wheel spacing is greater and the total bending moment produced by the wheel effects augments the wheel contact intensities two or three times their former amounts, in the light sections.

The depression of the stiffer rails from the trackmen's surface is from ⅛ to ⅜ inch, compared to ⅝ to 1 inch under the former light and limber rails; the maximum deflections in either case occurred at or near the joints. The increased stiffness and strength of the sections,—mechanical properties by design,—render the track smoother, with firmer joints and less undulations, even when carrying the larger bending mo-

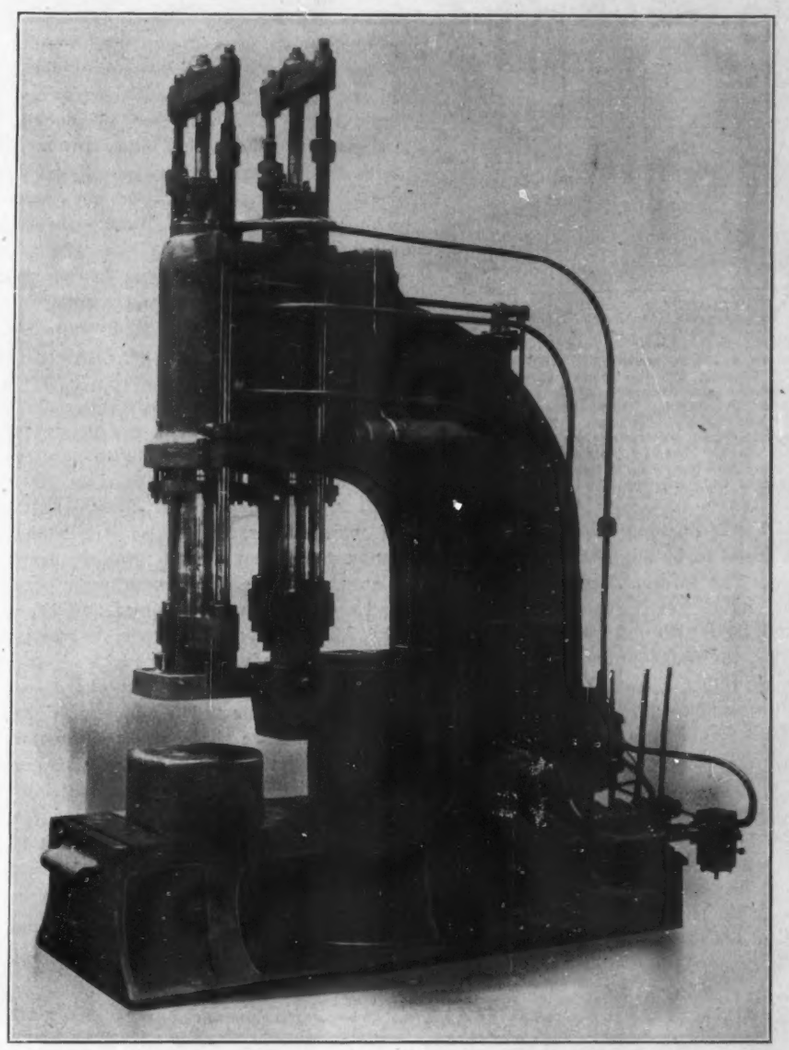


FIG. 7.—HYDRAULIC FLANGING PRESS.

ments of the doubled and trebled wheel loads.

The percentage of generated destructive wheel effects on the limber rails has been reduced more than one-half by the stiffer and smoother rails,

FIG. 1.—LAMINAE IN STEEL RAIL.

Shows the laminae of metal with slag inclusions crushing under the wheel loads, the cusp forming at the point of weakest resistance—a slag inclusion of larger dimensions—then by shearing, the checks develop upward and transversely under the rolling loads, separating and expanding the upper layer of metal in the bearing surface from the core of more or less fragile segregated metal underneath, thus starting the vertical check.

which has enabled the static and paying loads to be augmented in a greater ratio. The former 20,000-pound freight cars have been replaced by those of 60,000, 80,000 and 100,000 pounds capacity, the 60,000-pound being the light car of today, while the 100,000-pound is the standard for mineral traffic.

The freight train load has increased from 500 and 600 tons to 3,000 and 4,000 tons, and the volume of traffic in like ratio. The axle loads under freight locomotives have risen from 25,000 to 50,000 pounds, with four pairs coupled instead of two, and in the passenger service 55,000 to 57,500 pounds are common axle loads for recent locomotives, which attain speeds of 80 miles per hour daily to maintain their schedules of 54 miles per hour, including stops. New York and Chicago, 960 miles apart in distance, reduces to 18 hours by train, on stiff rails. The expended tractive effort has increased from 500 to 1,200 or more horsepower, a decided factor in augmenting the wheel contact pressures, bending moments, and consequent stresses in the rails as girders.

The steel bridges installed with the limber rails for an expected life of a century, have been replaced by those of more than double capacity for wheel and train loads, to realize the benefits of the stiff rails to handle the unexpected development of traffic.

The experience with the early limber rails was, that the quality for the light wheel loads was satisfactory, but their deficiencies were the small mechanical properties for the increasing wheel loads. Endurance shafts have been made from a number of those early rails which rendered 12 to 15 years service, and at 35,000 and 40,000 pounds unit fiber stress they have sustained only from 600,000 to 3,000,000 rotations, excepting a single brand of steel in which the elastic limits were from 52,000 to 56,000 pounds per square inch.

The ingots were drawn into blooms under steam hammers, their unoxidized blow holes were welded and formed solid steel, as a rule, for subsequent rolling into rails. This important fact, with the limited work required of the metal to carry and sustain the light wheel loads, has misled many railroad officials and investigators as to the essential physical properties in sound steel which are required in combination with large mechanical properties in sections, for wear and as girders to sustain and carry the present wheel loads and high speed trains.

The distances between the producer and consumer in this country are so vast that over 30,000,000 tons of steel rails are required in the 220,000 miles of main tracks, nearly ten times the amount in Great Britain, and our steel plants must be commensurate in size and scope, and run at full capacity, for the 3,000,000 or more tons of yearly output demanded.

The mills have been remodeled, or rebuilt from time to time, as conditions of manufacture changed, for greater output, and the unit of production per unit of time for the limber sections has been multiplied several times for the stiffer and heavier sections. It is legitimate and proper to save all time possible between each distinct step in the process of manufacture or the performance of mechanical work. Rapidity does not deteriorate quality until the essential time for a step in the process is unduly reduced, then enlargement of the plant for that process is required for combined quantity and quality. The Bessemer departments have not been enlarged proportionately to the other parts of the mill, but the converters have been driven faster, and after recarburizing the blown metal, the time for complete chemical reactions and

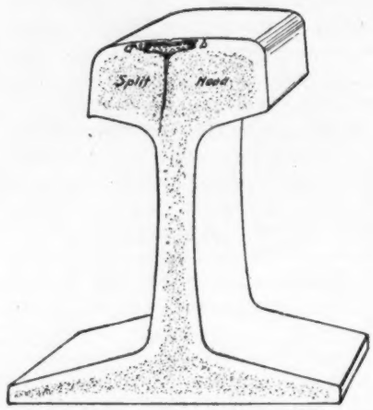


FIG. 2.—VERTICAL CHECK DEVELOPED UNTIL THE HEAD IS SPLIT.

The layer of metal in the bearing surface unchecked vertically at either a or b, the split widens, as it expands transversely—for the metal underneath becomes the anvil for the succession of blows delivered by the rolling wheels,—until the total is reached and the piece detached.

escape of the slag has been reduced unconsciously before teeming of the ingots commenced. The reactions but partially complete themselves in the setting steel of the ingot, and the slag, oxides, and gases are often entrained instead of eliminated. The minute globules or particles of slag from the reactions caught in the columnar structure, also in the secondary zone of blow holes, with or without associated oxides, are important factors in the checking of the tender skin of the ingots in blooming, and the subsequent tearing of the flanges as their extreme edges must slip in the passes of the rolls. The percentage of second quality and condemned rails is increased by these conditions.

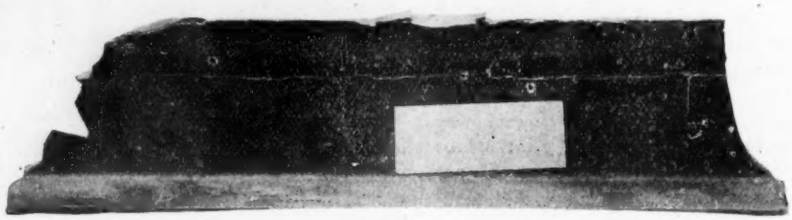


FIG. 3.—SIDE VIEW OF RAIL FROM WHICH ONE SIDE OF THE HEAD HAS SPLIT, AFTER 12 YEARS' SERVICE.

5⅛-inch, 80-pound rail, rolled 1892, laid same year in track No. 1, main line, N. Y. C. & H. R. R. R., west of Savannah ,relaid in track No. 4, 1903. Side of head detached and section broke as a girder, Feb. 24, 1907. Head lost in height ⅛ inch, for estimated 144,000 tons, high speed trains, and 72,000,000 tons of heavy freight traffic. Traces of slag in bearing surface but none on side walls of fracture.

The slag and occluded gases in connection with segregated metal are important factors in split heads of rails, which develop between the ends after

a short or long period of service, depending upon the thickness of the metal in the bearing surface, over the entrained slag and occluded gases.

The paper already mentioned, stated: The splitting of the head in the earlier rails was in nearly all cases traced directly to a pipe in the ingot. These conditions still exist, yet there are numerous instances in which the pipe (?) did not develop in cooling, but does in service, in unsound metal for the central core of the steel as indicated in Fig. 1. Pieces break from the side of the head, in steel where so decided liquation has occurred in the ingot as to make two or more grades of steel in the head.

FIG. 4.—PIECE SPLIT FROM HEAD OF RAIL., 5⅛-INCH, 80-POUND, ROLLED 1892, LAID SAME YEAR, BROKE FEBRUARY, 1907.

Traces of slag in bearing surface, and the lines visible between separated metal underneath. See Fig. 5. Trace of minute seam in center of head.

Continued examinations of numerous fractures of split heads, designated by the trackmen as "pipes," but which did not develop in cooling of the metal at the mill, but after short or long periods of service in the track, show that this type is the most frequent in the rapid increase of failures from so-called "piped rails" of recent manufacture. The shrinkage of the metal in cooling at best is only a minor factor as a contributing cause. Neither are the split heads confined to the top rails from the ingots, but have been found in less numbers from all the rails of the ingot, where they have been lettered or numbered for subsequent identification.

Of a rolling of 10,000 tons in September, 1900, in the A. S. C. E. 80-pound section, by July 1, 1906, 9.61 per cent of the rails had been removed from the track for split heads.

Subsequent rollings per year are showing split heads though the percentage of removed rails is not yet as high. Of the same brand, of a rolling of 3,000 tons in September, 1903, from another mill, over one-fourth of the rails were removed in 1904, of which a large percentage had split heads, in connection with otherwise decidedly unsound metal.

Rails were taken from the track which indicated a split head had started to develop, and slag was found as a series of minute flattened longitudinal threads in the thin layer of metal in the bearing surface over the developed vertical check in the metal underneath, as illustrated in Fig. 1.

The slag located so near the bearing surface is crushed by the constant rolling loads at what becomes subsequently the cusp of the curve of the upper detached metal from that underneath, and by repeated rolling loads shears and expands transversely, retaining each increment beyond its elastic limits, splitting the separated metal of the head underneath.

The composition of steel rails shown in Fig. 2 is carbon 0.55 to 0.60, manganese 1.00 to 1.20, silicon 0.10 to 0.15, phosphorus not to exceed 0.06, sulphur not to exceed 0.7. The copper, which was not specified, averaged in those rails 0.7 to 0.8. The iron was remelted in cupolas and the temperature of the heat in the converter regulated by 1,800 to 2,000 pounds of scrap, charged before the receipt of the molten iron. The bath was recarbonized in the converter and the metal poled in the ladle by thrusting in a green wood pole. It was 1 or 2 minutes before teeming of the ingots commenced; the ladle nozzle was 1⅛ inches in diameter, and six or seven minutes were consumed in pouring the 10-ton heat in five ingots 15 x 15 inches square on the base and of sufficient length for three 30-foot rails. The ingots were charged into horizontal furnaces, rolled direct in 13 passes, 3½ minutes from first blooming to the finishing pass. The hot rails were sawed ½ inch longer than for present practice, and spaced six inches apart on the hot beds, and turned after recalescence of the head.

Five hundred thousand tons of rails of that character were made, with the exception that for the 100-pound sections the carbon was raised 5 to 10 points and the manganese about 10 points higher than for the 80-pound rails. To date only 18 specimens are known to have developed what may be termed split heads, or "piped rails," as generally understood by the latter term.

FIG. 6.—END VIEW OF SPLIT HEAD.

Ninety-pound A. S. C. E. section, C. C. C. & St. L. Ry. Heat No. 44011, rolled August, 1905, laid September, 1905, removed July 27, 1906.

The rails from the ingots were lettered A for the top rail, B for the second rail, and C for the third. These letters can be found in the tracks, and as would be expected, the A rails have a larger percentage of impurities than the B or C rails. They wear faster, developing more surface defects, and at several points upon the road, under heavy traffic, after 10 and 12 years' ser-

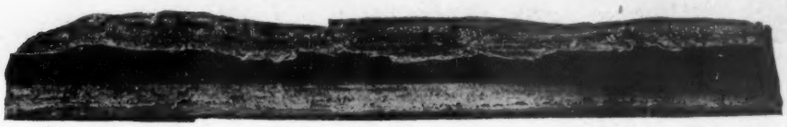


FIG. 5.—TOP VIEW OF FIG. 4, THE ENDS REVERSED.

The irregular line of fracture in the bearing surface, and the bruised surfaces of the lower plane of separated metal of the central core of the head, are well defined. The dark part of the bearing surface is the black streak in the rail, which indicates to the trackmen that a split head is developing.

FIG. 7.—SIDE VIEW OF SAME RAIL AS NO. 6.

Segregated metal shows, but not the slightest trace of a pipe. Seven minute threads of slag were counted in the thin layer of separated metal of the bearing surface.

vice, have become practically worn out for main line traffic, while the B and C rails are still good.

It should be stated in reference to these defective rails that many times the minute quantities of slag in the bearing surface, without a larger blow hole in the secondary zone, do not always produce a split head, but the surface wearing away, flows laterally from the bearing surface, without splitting the rail head. It is also well known that the rail head composed of steel of a high degree of porosity, the metal will flow sidewise to the outer edge, without making a split head.

The rails of the composition above mentioned, as girders have rendered excellent service, rarely breaking in extreme cold weather.

The explanations in reference to Fig. 2 also apply to Fig. 3 as part of the same rail.

The pieces of rails in Figs. 4 and 5 illustrate split heads from the breaking of a thinner layer of metal in the bearing surface, than that in Figs. 2 and 3, the rail failing after 11 months of service. The ingots were teemed with a 3 inch nozzle.

My records show as a general observation that rails rolled in August and September, when there is much humidity in the air, have developed split heads in greater numbers than those rolled during the winter season.

The use of refrigerated air, in which the moisture was reduced to a low limit, would be preferable for use in the Bessemer converters. Each ton of metal converted requires approximately about 0.6 ton of air to be blown through it and with a large percentage of moisture it affects the physical properties of the metal by a greater inclusion of gases. The practice of many mills, with direct metal, to use a jet of steam to regulate the temperature of the blowing metal in lieu of scrap, is decidedly objectionable, and injurious to the resulting product.

FIG. 8.—SIDE VIEW, FROM SIDE OF 5⅛-INCH, 80-POUND RAIL, ROLLED 1901, BROKEN MARCH 15, 1907.

This was a piped rail from a well defined cavity in the ingot, the side walls oxidized in heating. The piece was detached by the spreading of the metal in the bearing surface.

The piece of rail represented in Fig. 6 was broken from the head of a piped rail. The side walls of the pipe which had been closed in rolling were oxidized in the soaking pits. The failure of the rail however, was due to the spreading of the metal in the bearing surface as already indicated. Seams from inclusions of slag are visible on the under side of the head.

The percentage of split heads can be decreased by giving the metal in the ladle more time for the slag, oxides and gases to escape, before teeming, than is usual in the present rapid practice. It needs only a return to the older methods of allowing more time after recarburizing for the chemical reactions, escape of the slag, oxides, and other impurities, to improve the soundness of the ingots. In the large ingots, those of 20 x 21 inches or 24 x 27 inches on the base, and comparatively short, the steel can be made to set sounder and better than in the smaller bases and proportionately longer ingots. The escape of the slag must be in the ladle before teeming to prevent it being entrained in the skin of the ingot. The segregation in the larger ingots with the longer time of cooling seems to be more pronounced, but unless layers of slag are found in the exterior portions of the head of the rail, split heads have not so far been as numerous in that type of ingot as in the relatively smaller base but longer ingot. The number of seconds and condemned rails is also proportionately less.

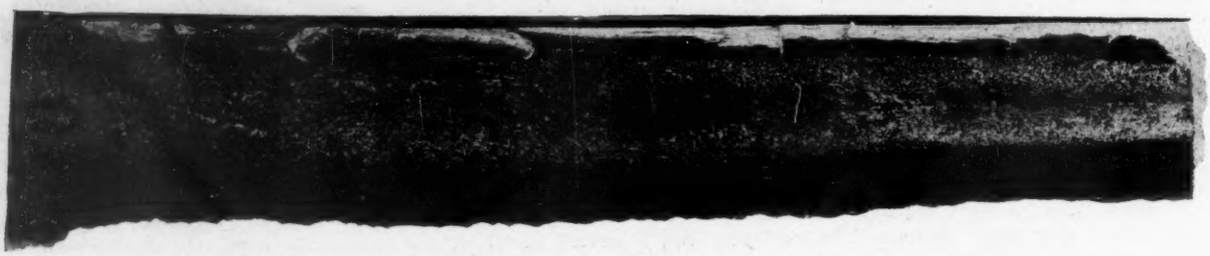


FIG. 9.—LONGITUDINAL SECTIONS OF SPLIT HEAD OF 100-POUND RAIL, NEW YORK CENTRAL LINES.

Rail rolled by the Lackawanna Iron & Steel Co., Scranton, May, 1893, laid in the following June in Grand Central yards on inbound main line, and removed June 12, 1907. The rail has been used in each side of the inbound main line, but dates of change have not yet been traced. The rail was removed from the track for the purpose of tracing the split in the head before the surfaces were completely oxidized. Minute layers of slag have been noticed in the bearing surface. These are just visible under magnification of 25 diameters. Seams which have developed in the bearing surface after so many years' service are noticed in Fig. 10, which is a part of the same rail. The estimated tonnage which has passed over the rail is over 350,000 tons.

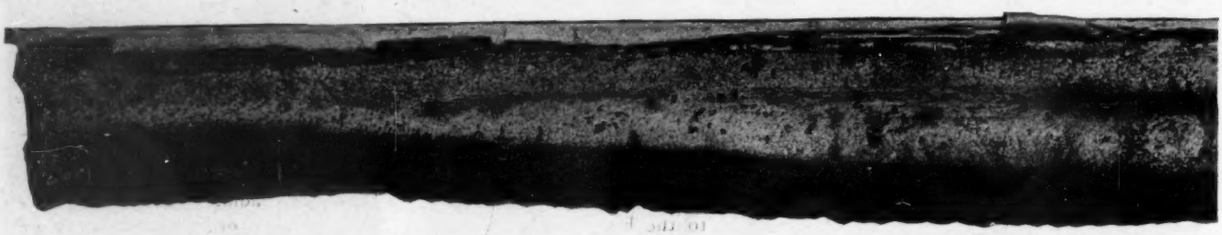


FIG. 10.—DEFINITE TRACES OF THE SEGREGATED METAL BUT WITHOUT SEAMS, EXCEPT THOSE IMMEDIATELY IN THE BEARING SURFACE.

The split had extended 10 feet in length in this rail, and it is probable that in another month the split would have extended two or three feet further towards the center of the rail. The lower dark surface of the section is from oxidation from the opening below the head of the rail. The minute curved lines as the fracture proceeded may be noticed in this specimen. The metal while segregated is comparatively sound. This can be understood from the fact that it has carried such an enormous tonnage in its long period of service. The rail has lost about ⅛ inch in height for this enormous tonnage.

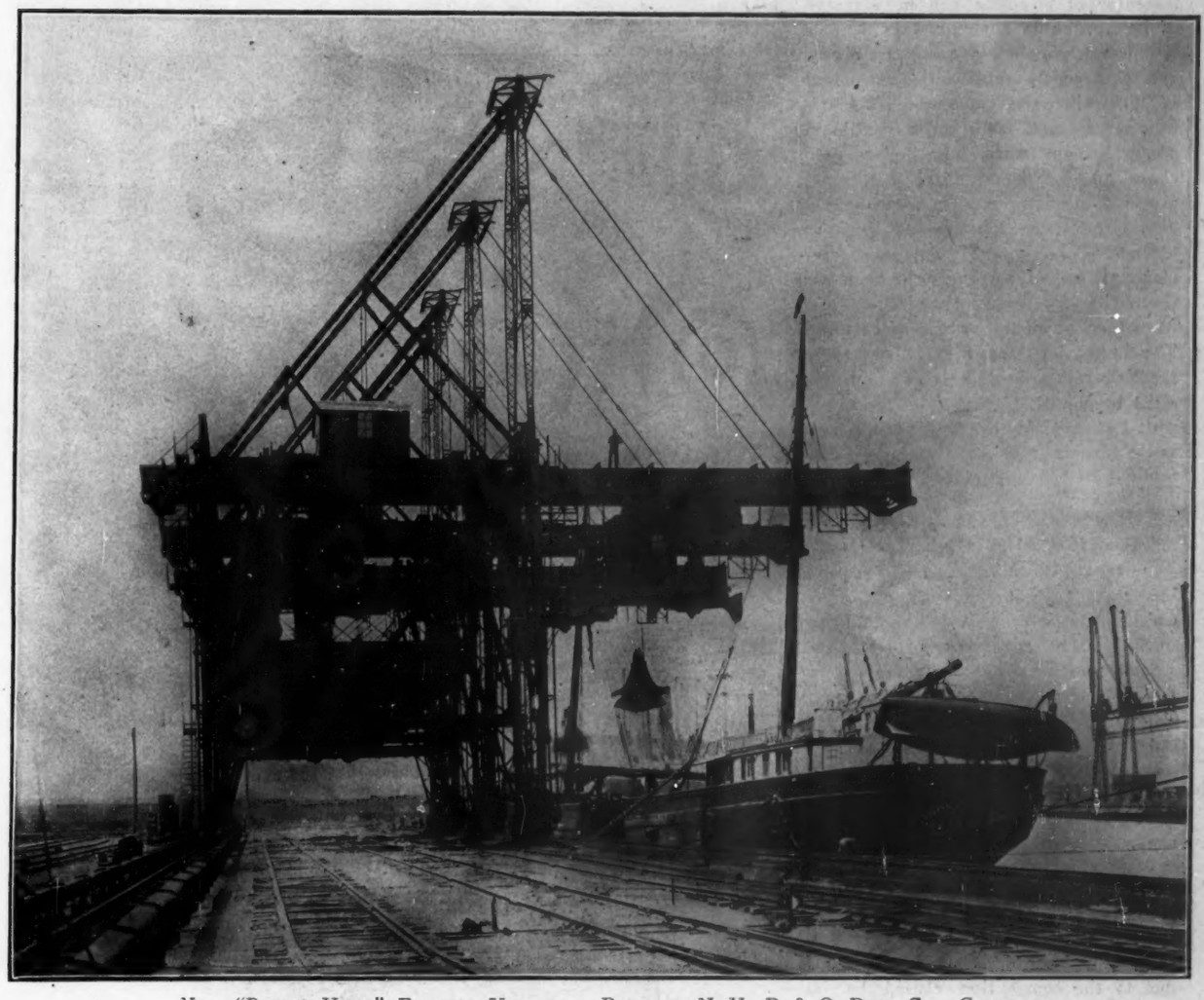
The heavy wheel loads of the present service must be expected to affect the metal in the bearing surface more quickly than was the case with the lighter loads on the limber rails. It is quality and sound metal that is required in any form of section at the present day, to sustain the high speed trains, heavy wheel loads, and large expenditure of tractive effort.

The experience with 75, 80 and 100-pound stiffer rails, which were made with 0.06 phosphorus, and 0.50 to 0.65 carbon, have sustained the present heavy traffic for a number of years in the bearing surface without undue wear, and have not broken as girders, under the high speed trains, heavy axle loads, and the large expenditure of tractive effort. The failure by the breaking down of the rail heads has been traced in all cases to unsound metal, rather than its distribution in the section. The failure of recently rolled rails in the heavy sections, either as to rapid wear or breaking of the heads, or the entire section, seeems to be due to inadequate physical properties in combination with unsound metal. To sustain the heavy service and with the large output demanded, it is more difficult to make a rail owing to the lack of time for the necessary steps in the process rather than that of deficiency in the processes themselves, except as to the high phosphorus and sulphur. The high phosphorus, even with low carbons and cold rolling, makes a metal of greater fragility than was produced with the lower phosphorus and higher carbons when rolled even at the higher temperatures of the preceding decade.

Compression of the ingots would check the segregation of the metalloids in those of large dimensions, and the discard required for sound metal would be small.

NEW ELECTRIC UNLOADING PLANT AT CLEVELAND.

Equipped with scale hoppers, which weigh out the required burden into the awaiting car, four "Brown Hoist" electric unloading machines have just been erected and placed in operation at the Erie railroad docks, Cleveland, foot of West 25th street, constituting one of the most modern unloading plants now at work in the ore industry of that city. The machines are the first of the new type of Brown electric unloaders to be erected in Cleveland. They were built by the Brown Hoisting Machinery Co., of that city.



NEW "BROWN HOIST" ELECTRIC UNLOADING PLANT OF N. Y., P. & O. DOCK CO., CLEVELAND.

The advantages claimed for the scale hopper are numerous. After the ore has been taken up and dumped into the hopper, the load is weighed out into the railroad cars, thus insuring a train of full capacity and removing the need of extensive yards, as practically no switching is necessary before starting the ore train toward its desti-

nation. When once the cars are loaded, they are immediately ready to begin their trip to the furnaces.

The new plant takes the place of 15 Brown high-level, unloading and conveying bridges, and will greatly dispatch in the handling of the ore. It will be able to receive and discharge from 8,000 to 10,000 tons daily, and it is hoped by the management that a freighter of any size can be divested of its burden in a single day.

The machines are operated by a new and thoroughly modern power plant of 1,050 kilowatts capacity. This station is equipped with three 350-horsepower Stirling water-tube boilers with chain grate stokers; three 525-horsepower cross-compound condensing engines, and three 350-kilowatt Western Electric generators. It will supply the electrical power for the unloaders, the electricity for lighting the dock and for other purposes of the operations. The improved dock is the property of the Erie railroad and is leased and operated by the N. Y., P. & O. Dock Co., with Pickands, Mather & Co., Cleveland, as the manager. W. T. Moore is superintendent of the unloading plant.

TURKISH MACHINE TOOLS.

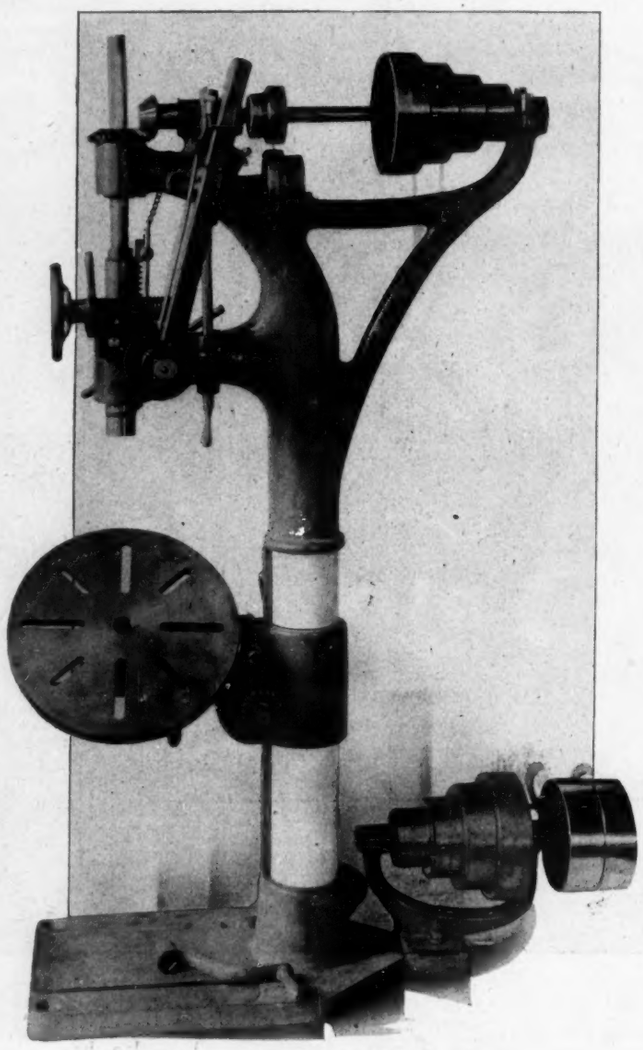
Consul E. L. Harris reports that in 1857 there were no factories in Smyrna which manufactured steam engines or supplies. The completion of the Aidin railway, however, gave an impulse to this industry, which was further augmented by the introduction of cotton growing, which created a demand for iron products. There are at present three large machine factories in Smyrna and a number of small ones manufacturing engines, boilers, hydraulic oil presses, steam and hand pumps, milling machinery, tanks for water and oil, carts and rather primitive agricultural machinery. The annual output of machinery by the factories is not on the increase. This is due to the competition caused by imported machines. Consul Harris says that if the proper steps were taken by American manufacturers there would be practically no limit to the trade that may be secured when the country is properly opened up.

The strike of molders, metal polishers and brass workers at Detroit, which has been in progress for the past six weeks, has been ended. The basis of the settlement has not yet been announced.

Fire in the work shop of the foundry of Hutchinson Bros., Baltimore, damaged the building and patterns to the extent of $2,000.

A NEW DRILL PRESS.

The accompanying illustration shows the Robertson universal No. 21 drill press, which has recently been designed by the Robertson Mfg. Co., Buffalo. The capacity of the machine is 21 inches from the center of the circle. The principal feature of the machine is the universal table, a useful feature in that it is often necessary to drill a piece at such an angle that it requires strapping to the table. With a regular stationary table, each hole to be drilled requires constant changing and reclamping, while the universal table here shown gives any angle from 0 to 90 degrees.



ROBERTSON 21-INCH UNIVERSAL DRILL.

The column carries a rack and the knee is raised by means of a crank fitted to a steel shaft, carrying a steel gear, which engages with the rack. The rack is also of steel with the teeth cut from the solid bar. The universal head is on the outer end of the knee and is turned and faced. A bearing 2¼ inches diameter by 4½ inches long is in the flange of the head and receives the stem on the outer half of the head, which supports the table. To add rigidity, a lip fitting the rebore in the knee is on the face of the flange. To bind both faces, together, a stud and nut is used and also a split bearing with lugs and clamping screws. When the table is parallel or at 45 or 90 degrees, a square block is used.

The following equipment is furnished with the machine: Universal table or solid knee; lever feed; or wheel and quick return power feed; automatic stop; and when desired, back gears.

The bevel driving gears are planed from solid metal, and are covered for protection from accident. The spindle is of special carbon steel, well fitted and supported in the sleeve by

nuts with fiber thrust collars. The hole in the spindle is Morse No. 3 taper. By the movement of a lever convenient to the operator, any change in feed combination can be had.

The column is heavy and secured to the base by a clamping bolt. The base is provided with T-slots and a foot belt shifter for starting and stopping. The machine is designed for hard service. Every part is interchangeable.

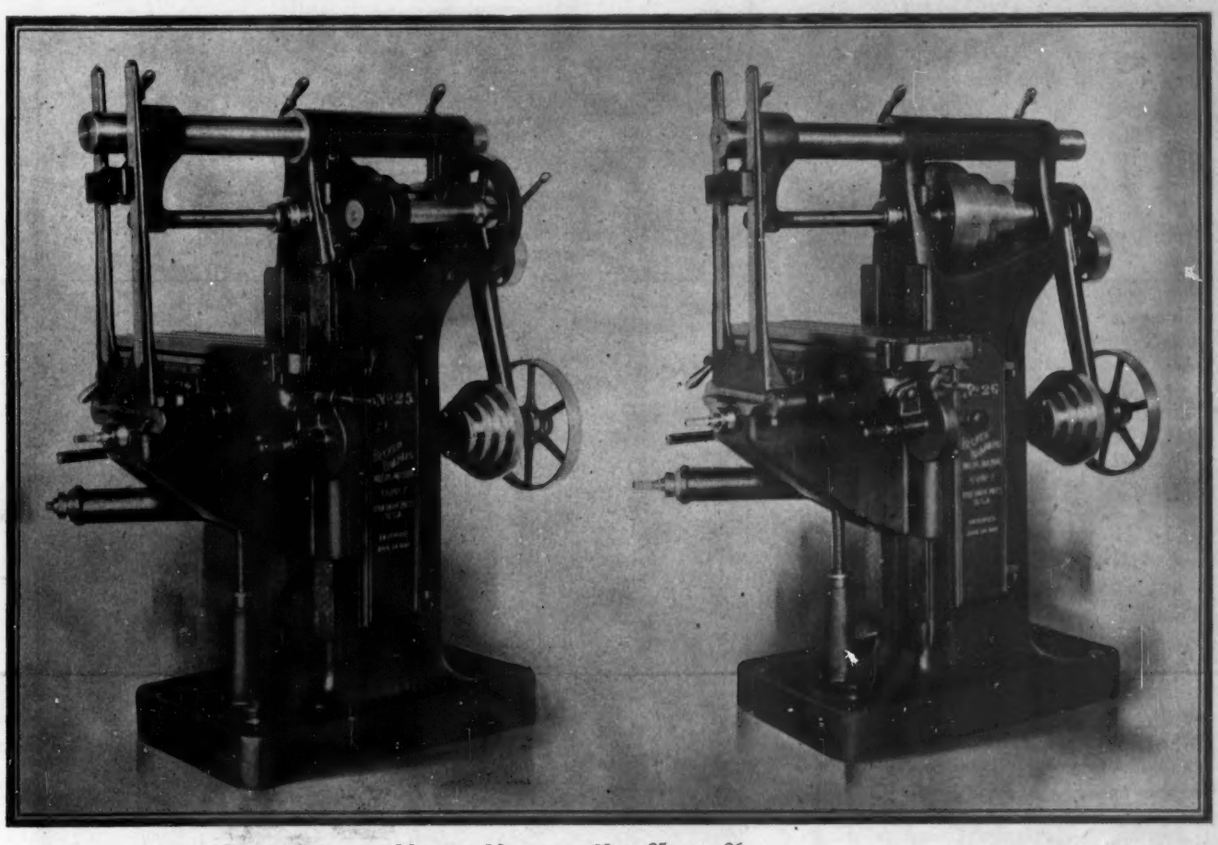
At the close of 1906, the state of Alabama possessed 9,973 coke ovens, the production of which during that year was 3,217,063 tons, compared with 2,576,786 tons in 1905, an increase of 640,282 tons, according to the report of J. M. Gray, chief mining inspector. The principal companies owning and operating this property were the Tennessee Coal, Iron & Railroad Co. with 2,576 ovens and a production of 1,148,192 tons; the Sloss-Sheffield Steel & Iron Co. with 1,438 ovens and a production of 492,031 tons, and the Republic Iron & Steel Co. with 1,010 ovens and a production of 284,715 tons. The total production of coal in the state for 1906 was 12,851,775 tons, against 11,900,153 tons in 1905, an increase of 951,622 tons.

TWO NEW BECKER-BRAINARD MILLING MACHINES.

The accompanying illustrations show the No. 25 and No. 26 milling machines recently designed by the Becker-Brainard Milling Machine Co., Hyde Park, Mass. These are made in two styles, No. 25 being back geared and No. 26 having no back gears. Special attention has been paid in the design to the requirements of the manufacturer of small machine parts produced in large quantities, as are found in making small arms, typewriters, sewing machines and in electrical work. Special attention has also been given to the feed mechanism, that they may be able to withstand the full power of the driving belt, and yet give good service in the rough usage to which machines of this type are apt to be subjected. The feed is driven by belts, which obtain their motion from the spindle of the machine by means of a gear train, so arranged that the velocity of the belt is sufficient to drive all feeds that the main belt will stand. Feed changes are obtained by four step cones and by interchanging the feed driving pulleys at the back of the machine, the combination giving eight changes, ranging from 0.007 to 0.100 inch.

The table is operated by a worm and hobbed rack, the worm being driven by a worm gear of large size and a worm of coarse pitch and corresponding high efficiency. The feed is disengaged by means of a novel drop worm mechanism, which throws the worm out of mesh with the gear, it leaving in a path at right angles to the gear. This overcomes the objection to the old style gravity drop worm of clinging to the gear by friction alone. The wear on the worm gear teeth is also equalized. The worm is engaged and thrown out of mesh by the same lever, making a convenient and positive method of automatically disengaging the feed and stopping the travel of the table at any predetermined point. A quick return of 4 : 1 is supplied to the table, permitting it to be returned to its original position in the least possible time.

The knee on this new machine has been lengthened sufficiently to allow a harness brace to be used for an arbor and to still have a cross feed range for the table equal to that of the old style machines. The harness consists



BECKER-BRAINERD MILLING MACHINES NOS. 25 AND 26.

of a brace gibbed to the knee slide and a clamp that is fastened to the arbor support yoke in such manner that it may be swiveled around its center, allowing the brace to be removed without removing any bolts. The clamp is made fast to the brace by friction, giving a more rigid hold than the former bolt washer and slot arrangement, and, at the same time, allowing a much stiffer brace. The arm, a solid steel bar, is adjustable lengthwise.

The machines have a rigid box knee with a telescopic elevating screw, which does not project below the floor line, allowing the machine to be set in any position without regard to the beams in the floor. The spindle cone and back gears are of the standard Becker-Brainard design, the spindle bearing being cylindrical in form. The wear is taken up by concentric compensating bronze boxes.

The range of the machines is as follows: Longitudinal feed, 34 inches; cross feed, 8 inches; vertical adjustment, 18 inches. The net weight of the machine is 1,650 pounds.

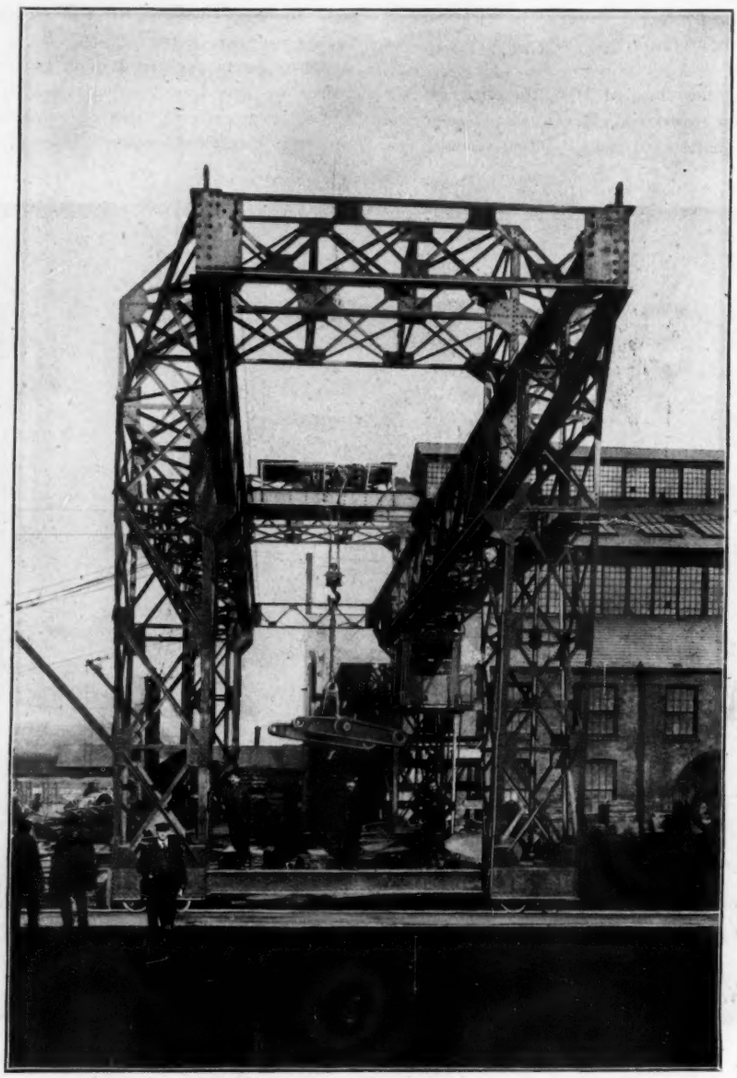
The base of the machine has been designed on the same line as the other Becker-Brainard milling machines, and is extra heavy, absorbing all vibration. New patterns were made for the machines and great care was given to the symmetrical appearance as a whole.

A NEW "PITTSBURG" VISE.

The Pittsburg Automatic Vise & Tool Co., Pittsburg, has recently devised a vise especially adapted for automobile and motor boat work. It comprises a base 1¾ inches diameter to be fastened to any rigid portion of the boat or automobile, to which the vise may be attached when it is to be used. At other times it may be packed away in the tool box. To insert the vise into the base, it is simply set in the socket and the jaws are tightened on a piece of work, which results in the vise being automatically clamped in the base. The vise is constructed with a double swiveling motion, it being free to turn in a complete circle in the base, or the jaws may be rotated around the axis of the vise screws. The tightening of the jaws on the work clamps both swiveling motions automatically. The vise is provided with 1¾-inch jaws, with an opening of three inches, and weighs 3½ pounds. The parts subjected to stresses are of alloy steel and the screw is a steel forging, all parts being interchangeable.

NILES ELECTRIC GANTRY CRANE FOR ILLINOIS STEEL CO.

We present, herewith, a description and illustration of a large Niles electric traveling gantry crane, built by the crane department of the Niles-Bement-Pond Co., New York, and lately installed at the South Chicago works of the Illinois Steel Co. The crane is of 15 tons capacity, and runs on a track laid on the ground 56 feet center to center of rails with a cantilever extension on one end of 12 feet 9 inches and 28 feet 3 inches on the opposite end, making the total length of girders 97 feet. The girders are of lattice construction with auxiliary brace.



Niles Electric Gantry Crane For Illinois Steel Co.—End View.

The main girders are built up with universal mill plates and angles to form the top and bottom chords, fastened together by lattice angles. The auxiliary girders are of lattice construction so arranged as to secure great strength and rigidity and minimum surface, which is important in yard cranes exposed to the elements. The girders are supported upon structural steel A-frames of the same construction as the bridges, these A-frames extending above the girders where they are held together, allowing sufficient space beneath for the passage of the trolley, which is free to traverse the entire length of the crane.

The supporting columns are also connected together at the lower ends by substantial bridge trucks, each truck carrying four double flanged machined tread truck wheels, mounted in pairs with equalizing connections to the bridge track, so as to compensate for any irregularity in the runway tracks. Two of these equaliz-

ing truck wheels on each bridge end are connected by spur gears and pinions. The truck axles are of steel, accurately turned and ground, and revolve in bronze bearings with waste cellars beneath. The truck wheels are forced on by hydraulic pressure and prevented from turning on the axle by carefully fitted straight feathers or keys.

The bridge drive shaft is connected to each pair of equalizing truck wheels by miter gears, the vertical shafts being supported by roller thrust bearings. The bridge trucks are equipped at each end with a pilot to aid in removing any obstruction that may be on the track.

The bridge drive motor is located on the girders approximately in the center between the runway tracks, where it is connected by a spur gear and pinion to the steel bridge drive shaft, which is carried in cap bearings and uniformly supported the entire length. This shaft is of sufficient strength to transmit the entire effort of the motor and to skid the wheels on the track.

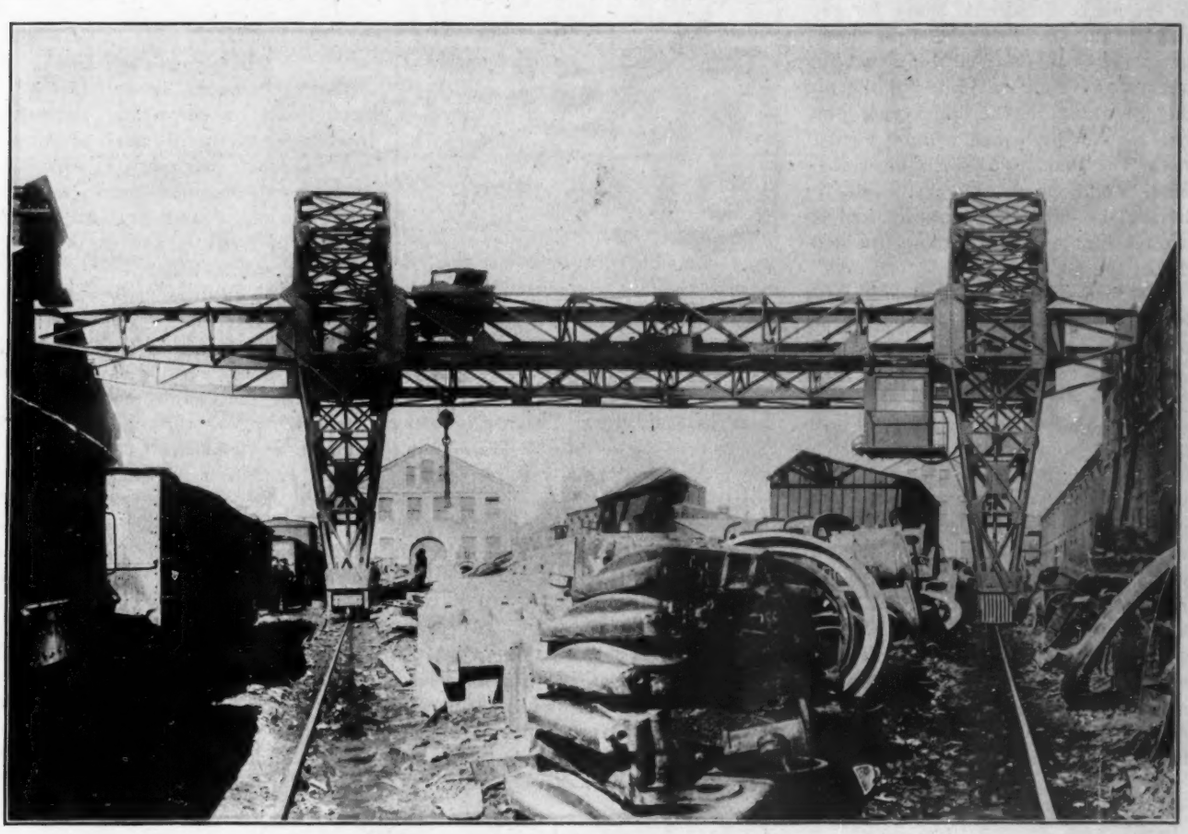
The cage is inclosed to protect the crane operator from the weather and fitted with drop windows and sliding door. A steel ladder is attached to one of the supporting columns reaching from the ground to a platform on the floor level of the cage from which access is had to the cage. This platform is surrounded by substantial hand rail and an additional ladder is furnished reaching from the cage platform to the foot-walk extending the entire length of the bridge drive shaft, allowing easy access to all gears and bearings.

The bridge drive motor is equipped with a powerful foot brake. The brake shoes are withheld from contact with the brake drum, except when applied by the operator, thereby eliminating friction and reducing the wear on the brake shoes and drum to a minimum. This brake is operated by a foot lever located conveniently in the cage.

The trolley is of steel construction, the design being such as to eliminate all over-hung gears. The truck axles revolve in bronze bearings with standard waste cellars beneath. The hoisting mechanism is equipped with both electric motor and mechanical load brakes, running in an oil bath. All gears throughout the crane are cut from solid steel castings, the pinions from open-hearth steel forgings.

The speed of the hoist is 30 feet per minute, when lifting a load of 15 tons. The trolley speed is 150 feet per minute, and the bridge speed 250 feet per minute under same conditions. The entire trolley is inclosed to protect it from the weather, the cover being fitted with hinged doors arranged so as to allow easy access to all parts for examination or repairs. An examination of the illustration herewith will convey a slight idea of the massive construction of the entire structure.

The design of this crane is especially convenient for yard service, the cantilever extension being long enough on one end to cover a single track and on the opposite end two tracks, the entire space between the runway tracks being available for storage purposes and the travel of the crane being limited only by the length of the storage yards and tracks. The arrangement as described above is such that a load of 15 tons can be lifted and transported to or from a car on any of the three tracks mentioned, or from the storage space between the supporting columns as desired. This design, it will be noted, dispenses with the usual overhead stationary runway, thereby effecting a material reduction in first cost.



NILES ELECTRIC GANTRY CRANE FOR ILLINOIS STEEL CO.

MINING OPERATIONS IN THE MESABI

Office of THE IRON TRADE REVIEW,
411 Providence Bldg.,
Duluth, Minn., June 29.

The Commodore mine at Virginia has almost entirely lost its former aspect of a milling pit and underground mine after the two seasons of stripping it has passed through. One shovel is still stripping, widening out at the entrance to the pit. The other shovel is in the ore. Fig. 3 is a sketch showing something of the shape the pit is in. As indicated, the north half of the pit is in splendid shape for getting out the ore except when the shovel gets down at the end of a cut up against the high east bank of the pit, and, working in the blind end, only one car can be loaded without switching. The time lost here is more than made up, however, by the saving in having the empties already spotted on a track running down through the middle of the pit.

A Lima geared locomotive is used for hauling the loaded cars out of the pit and it handles four steel cars up a 5 or 6 per cent grade at a fairly good speed. On the south side of the pit, a good sized area has been stripped with plenty of room for the shovel when it is put in on the ore.

A second pit was started at the Higgins this spring. It is not very large as yet and there is only one shovel at work. It lies just north of the old Higgins and covers a somewhat larger area than the present mine. Mining operations in the Higgins are continuing with a steam shovel in the bottom of the pit working here and there in a pocket or shelf of ore, the ore being hauled in a narrow gage to a mill.

The Minorca mine has put down a new shaft this year. It is located a considerable distance west of the No. 2 shaft and high on the hill.

The Hector mine at Biwabik is this season hoisting entirely through the new shaft put down last year to reach the deeper deposit of ore. The open pit has been cleaned up and shipments or rather output will be about the same as last year. Trouble is being experienced in getting the ore shipped owing to difficulties at lower lake ports and not only is the winter's stock pile still standing but is being increased by ore from the shaft. The present ore body will at least last through next season.

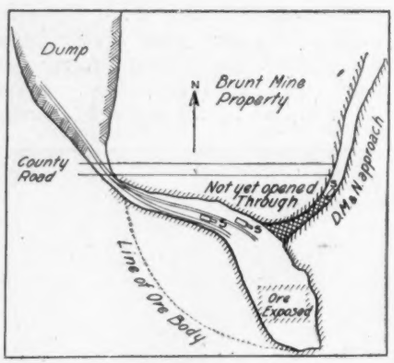


FIG. 1.—WACOUTAH MINE.

The property of Coates and Miller southwest of Hibbing in section 11-57-21 to be known as the Charlotte mine is still being explored. At present there are six drills on it and the ore body has been found to be very deep in some of the holes. Just how much ore the forty contains is as yet indeterminate, but it is undoubtedly a very nice deposit though containing a varying grade of ore, and under a heavy surface.

The Monica shaft of the Republic Iron & Steel Co. encountered a stratum of wet sand similar to that which temporarily caused trouble at the Kellogg. Below this, however, a more solid formation was again entered and, while there is some leakage and more or less pressure on the shaft, it is not sufficient to cause any trouble and no great amount is anticipated. It would not be surprising, considering the extent of the Monica ore body, to see the shaft temporarily abandoned, should extreme difficulties arise. At the Onandaga and Mariska, sinking is also in progress and the shafts are down about 100 feet.

The Kellogg drop shaft is now down about 70 feet and, as there is only about 10 feet more to go to the ledge, there is every reason to believe that it will be successfully sunk. Some of the sinking was through heavy clay and the shaft had to be weighted considerably with rails though no delays of any length have occurred. The ledge consists of a broken up taconite and is about 30 feet through. Shipments will probably be made from the Kellogg inside of another month. Of the other properties of the New York State Steel Co. the Larkin at Virginia and the Knox at Mesaba, the Larkin is doing nicely, but the Knox has not yet been opened up.

The Mountain Iron mine is driving

FIG. 2.—WACOUTAH MINE.

along at its usual pace. There are six shovels in ore and four in stripping. The stripping is being done all along the west side of the pit where three of the shovels are working. The other shovel is finishing up on the southeast corner where a large yardage of dirt was removed during the winter. The ore in the center of the pit, which was pretty much tied up last summer, has been released to a great extent by a shifting of tracks and at the bottom level the pit has now reached a depth of 225 feet from surface. While the mine will undoubtedly ship during the season all that is expected of it, which amount may change as the season advances, it hardly seems probable that last year's mark will be reached.

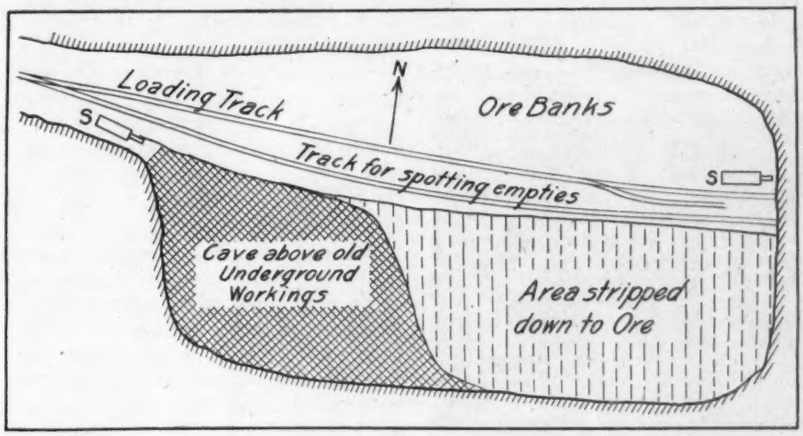


FIG. 3.—COMMODORE MINE.

A shovel was recently started stripping at the Hanna mine by the Consumers' Ore Co. A couple of hundred feet of the first cut have been made and the pit will be opened up in an east and west direction. It lies just north of the Wacoutah mine and from appearances which indicate a lack of suitable dumping ground and a rather confined area for a steam shovel proposition, it will be operated as a milling pit. Longyear is still drilling on the neighboring property.

At the Wacoutah a quantity of surface has been removed during the spring, but the shipping of ore which was begun last year over the Great Northern was not begun again this season, awaiting the completion of the approach which is now being cut through to the Duluth, Missabe & Northern tracks. Fig. 1 is a sketch of the pit and Fig. 2 a view looking from the far end of the pit out toward the stripping approach. Shipments will be resumed just as soon as the new approach is ready.

The Wacoutah approach is cut through the Brunt mine property and it is understood that sometime this year the stripping of the Brunt will be begun with the surface removed in cutting the approach as a beginning. The Brunt is really a stripping proposition, but just when work in that direction will be started has not been determined. No ore has been shipped from the Brunt stock pile as yet, but a steam shovel now cleaning up stock piles at the other properties of the company is expected to begin at the Brunt very soon. Underground the mining is not being crowded at all, as the mine is more than able to meet its schedule.

Just east of the Brunt, between the road and the Great Northern tracks, Nels Hanson, of Virginia, has a drill exploring a forty which he owns.

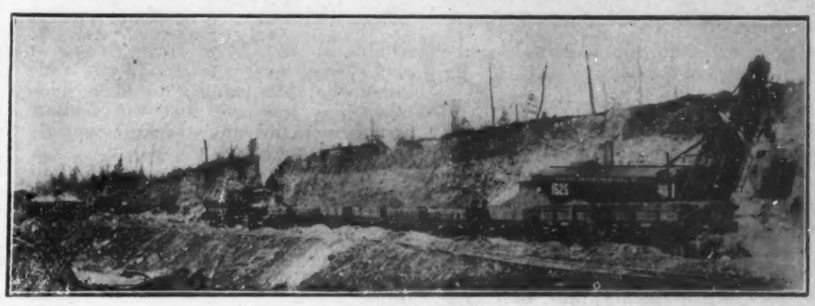


FIG. 4.—STRIPPING AT THE ADAMS.

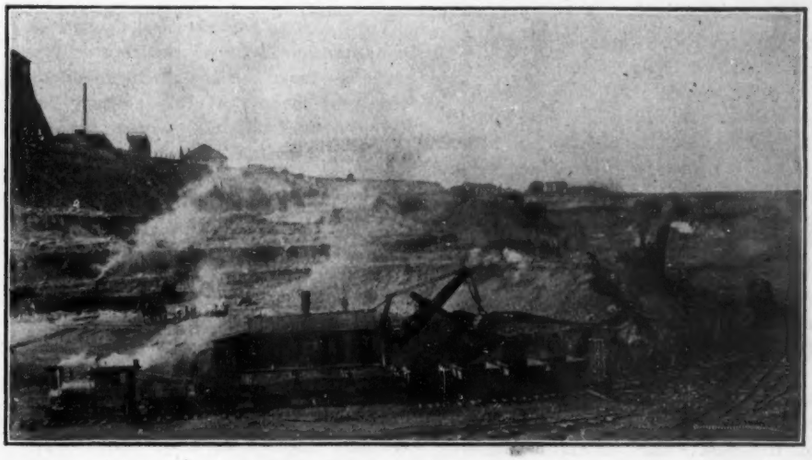


FIG. 5.—THE FAYAL MINE.

The Fayal mine has as interesting a history as any piece of iron property on the Mesabi range. At one time the fee owners attempted to dispose of the forties on which the mine now is for a few dollars per acre and were unable to find a purchaser. When ore was discovered upon the land it was believed to be a small deposit as indicated by the drill records, but in the space between the drill holes was a vein of ore that opened out into a much larger and unexpected ore body as the mine was developed. Even now the Fayal is just coming into its largest development as an open pit, the accompanying view showing a portion of the mine and the work opening up just finished in part this spring.

The Adams and Spruce mines at Eveleth, since ore was first mined there by the Lake Superior Consolidated Iron Mines, have been looked upon as unusually large mines. In their development they have borne out this belief completely and the somewhat unusual situation exists that

test pits have been put down across the ore body in a straight line that is a mile long. A cross-section a mile long doesn't happen every day. The Adams had one of the first milling pits and now is being changed for the most part to a steam shovel proposition, a view of the stripping being shown in the above cut.

THE BALDWIN LOCOMOTIVE WORKS AND THE METRIC SYSTEM.

Editor IRON TRADE REVIEW:—The newspaper advocates of the metric system have started their hobby again. It makes good filling matter for a paper in the dog days, when there is a dearth of news. The *New York Herald*, which a year or more ago, set its column fillers at work to interview everyone they could find who favored the metric system and published day after day columns of stuff in favor of the system, but not a word from its opponents, has got to work again. In its issue of Sunday, June 16, there are several columns concerning the building by the Baldwin Locomotive Works of 20 locomotives for the Paris-Orleans railroad, the contract price being $600,000. The drawings received from France were all dimensioned in the metric system. We quote from The Herald, as follows:

"The first impulse of the Baldwin works management was to convert all the measurements into the English units. It was evident from only a cursory inspection of them that this would be impossible. There were 500 sheets of the designs, calling for more than 10,000 different parts to each engine. The specifications required the De Glehn type of locomotive, a complicated piece of mechanism, which required special accuracy of construction.

"Even if the interminable fractions of inches which would have resulted from tranpsosition from the metric standard were employed, they would only be approximations and not in accordance with the contract. Owing to the great number of the drawings, the preparation of the shop designs would have kept 20 draftsmen busy for a month.

"There was nothing else to do but to employ the metric system. Six draftsmen working on the locomotive drawings and four on the tender designs were able within a few days to make the designs for shop use. The firm purchased metric standards, prepared metric gages and templates, and every workman received a jointed meter rule graduated to millimeters. The measurements on all the shop drawings were put in millimeters and no reference to the old system appeared anywhere in the figures."

And so the locomotives were built, and the *Herald* reporter interviews Mr. Vauclain, the superintendent of the works, who, it is well known, has for many years been one of the few practical machine shop men in the country who are advocates of the metric system and he gets a good story from him. We quote:

"All the drawings for the 20 De Glehn compound locomotives required," said Mr. Vauclain today, "were made out in the metric equivalents and were described in the French language. It required little trouble to translate the descriptions into English, but it did not take us long to decide to forego the pleasure of making new drawings with the English measurements. It would have been an enormous task.

"It was considered cheaper to educate the men in the metric system than to pay for the loss of time and money, which would have been caused by converting the drawings. There were measurements by the thousands, and to have covered the drawings over with myriads of decimal fractions, which would have resulted from the conversion, was wholly impracticable.

"It was a matter of short time delivery. The locomotives had to be done. We found that the men took to the metric system without any trouble at all. With them to use it once was to undertsand it. We found that the liability to make mistakes was less and that the decimal arrangement of the measure greatly facilitated the work.

"As far as the fine calculations were concerned, it must be borne in mind that nearly all the work is done by gages and that expert measures are only really required in the gage department. For many operations, it would be a matter of no concern to the workmen whether their gages were made in accordance with the metric or the English standard."

It all makes a nice story and the newspapers all over the country reprint portions of it, and draw the inference that the metric system of weights and measures is making great progress in this country. It may inspire the American Metric Bureau with new courage, and it may recover from the thrashing it got last year in the hearings on the metric bill before the last congress, and introduce a new bill, but what does the story really amount to, and what bearing has it on the real metric question? The French railroad wanted 20 locomotives and they were designed on the metric system, of course, to suit the convenience of their French designs and to be uniform with the other locomotives of the railroad. The Baldwin works could, of course, build them, for the cost either of redimensioning the drawings or of making gages and templates from the French measurements was a small matter compared with the prospective profit in a $600,000 contract. Thousands of similar instances of foreign orders in the metric system being filled in this country might be found, if anyone wanted to take the trouble to look for them. They involve either the redimensioning of the drawings and the making of the machine parts, in the nearest approximate American shop sizes, or else working with French scales and making templates, etc., with these scales. The fact that this can be done in any first class American shop is admitted by all intelligent opponents of congressional legislation in favor of the metric system.

The real question in regard to the metric system, which will come up every time a bill in its favor is introduced in congress, is not as to the comparative merits of the French and English system, nor as to the ease with which any American shop can work in the metric system, but it is the question what good will it do the American people to work in two systems, side by side, and if it will do them any good. Why should they not be allowed to discover it, as the Baldwin works seems to have done, without having an additional system forced on them by legislation? It is a long step from the Baldwin Locomotive Works making 20 locomotives for France on the metric system to its making 20 locomotives for the Pennsylvania railroad from Altoona designs in that system. It is a still longer step for the Baldwin Locomotive Works to change its own system of drawings to the metric measures and to make all its templates, gages, dies, screw thread, etc., on the French system, abandoning all its English measures. This, the anti-metric men claim can never be done, but nothing less than this is the declared object of the metricists.

The starting of another newspaper campaign in favor of the metric system is mere midsummer madness. The busy people of this country are heartily tired of the whole subject, but they must be prepared next winter to send another delegation to Washington to argue the question before another congressional committee, if the newspaper campaign results in another metric bill.

Wm. Kent.

Syracuse, N. Y., June 27, 1907.

Western Electric Earnings.—The Western Electric & Mfg. Co., and its subsidiaries, in its statement for April and May, the first two months of the present fiscal year, shows total income of $1,404,624, which, less the interest on bonds, miscellaneous interest, depreciation, etc., leaves net credit to surplus of $819,824.

BOOK REVIEW.

Producer Gas. First edition. By J. Emerson Dowson and A. T. Larter. New York. Longmans, Green & Co. 294 pages. 6 x 9 inches. Cloth. Supplied by The Iron Trade Review for $3.00.

Since the first gas producer was exhibited at York, England, in 1881, the use of the producer plant for various purposes requiring gas, and especially for furnishing gas for gas engines, has grown enormously. Mr. Dowson was the pioneer in this line and his experience of over 30 years in experiment and development fit him particularly for the duty of discussing it. The subject of formation of gas from various fuels and its application to various uses, with concise tables of performances of many plants are clearly set forth, and the reader cannot fail to note the eminently fair treatment accorded to the rival steam plant in comparing efficiencies and costs of power. For a work necessarily highly technical, the subject matter is clothed in more interesting and readable language than is often met with. The graphic methods of illustrating the heat efficiency of gas and steam plants, together with the very complete line of illustration of the whole range of producers from their earliest forms, make the work additionally valuable. Even the lay reader cannot fail to absorb much valuable information from its perusal.

The Detroit Trust Co., as receiver, is advertising for sale at public auction on July 24, at the office of E. Bement's Sons, Lansing, Mich., the entire manufacturing property of E. Bement's Sons, including plant fully equipped for the manufacture of stoves, agricultural implements and bob-sleds. E. Bement's Sons suffered financial losses in 1904, since which time the Detroit Trust Co. has operated the plant as receiver.

The new plant of the Seneca Iron & Steel Co. is fast nearing completion at Buffalo and as soon as the remainder of the machinery arrives and is installed, the company will begin the manufacture of galvanized steel along new lines.

The Alan Wood Iron & Steel Co., Conshohocken, Pa., has recently installed a Link-Belt inclined apron conveyor in connection with its billet shear, the conveyor being used to deliver the billets to cars on a narrow gage track.

FACTS CONCERNING FOUNDRY TRADE SCHOOLS.[1]

By W. W. McCarter.

The tendency of the industry, as unerring as the force of gravity, determines the mechanic working therein. Only the latest improvements command the market, and the law of supply and demand keeps out the reinvention of long abandoned methods and processes. The world moves on.

The subject of technical instruction, dry in itself, is nevertheless of paramount importance. I am indebted to our friend Mr. Lane, who writes me as follows on the subject of Foundry Schools: "Thus far no feasible means have been presented by which a practical school which would turn out molders could be successfully operated. There have been many propositions advanced, but thus far little practical results have been shown. Due credit should of course be given for this work, but so far as turning out practical molders, rather than shop superintendents, the result has yet to be seen."

Molding Hoisting Engine Cylinder. Seniors 1 and 2, Junior 3

The subject, in order to be better understood, should be investigated closer. The difficulty seems to lie in the way it is handled. Our young men may grow up within an atmosphere of active thought and intelligent cultivation, and all their powers be keenly stimulated. Just by as much as they are ardently interested, by just so much are their minds full of their occupation. There is a natural bent to every one's endeavors. If he leans toward the foundry, encourage him in this, and he will make a success

Rubbing Bed Mold. The Rough Castings Weighed 10½ Tons

[1] A paper presented at the Philadelphia (May, 1907) meeting of the American Foundrymen's Association.

of it. Give him literature on the subject, as well as other matter for his edification and instruction, and let him feel and know that his interests are in common with those of his employer.

Two Days' Output.

I will make a brief synopsis of a school I am now operating on a commercial basis. In order that an intelligent idea may be obtained of the nature of the work produced and its character, I will enumerate the total items contained in a two days' heat, March 11 and 12, as follows:

Six wind boxes for the Tennessee Copper Co.

Two screw frames for gang saws, movable worm.

Forty journal bearings for marble trucks.

Nine 20-inch driving wheel centers for locomotives.

LARGE CASTING MADE IN THE FOUNDRY

Five 22-inch driving wheel centers for locomotives.

One 40-inch driving wheel center for locomotives.

Two sections, troughs, for rubbing bed.

One large sand pump base.

One friction flange for hoisting engine.

Twelve driving boxes for 8-inch x 14-inch locomotives.

Four steam chests.

Four covers for rubbing bed troughs.

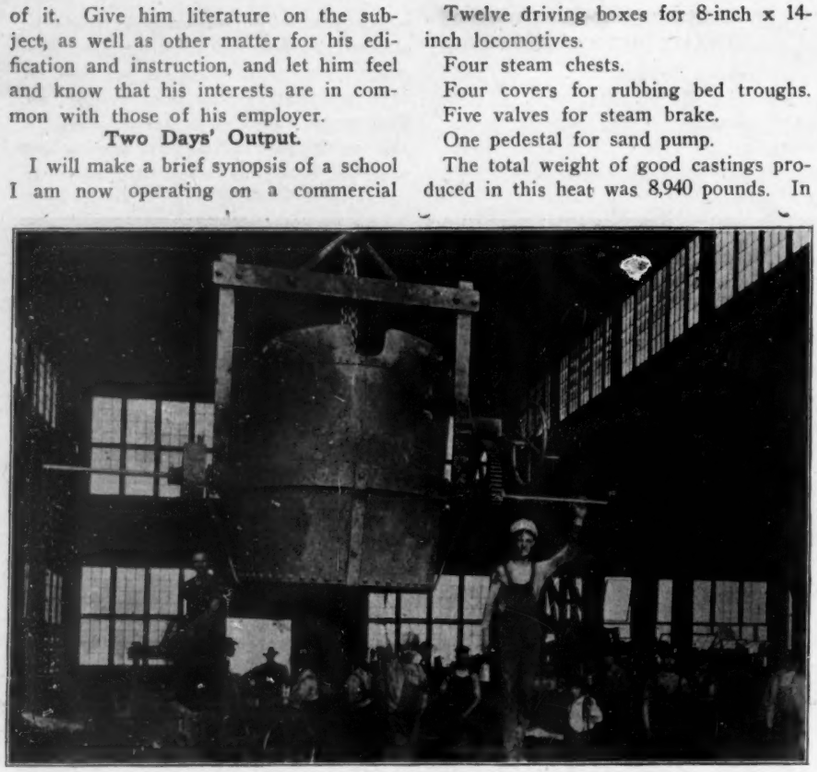
Five valves for steam brake.

One pedestal for sand pump.

The total weight of good castings produced in this heat was 8,940 pounds. In addition to the items enumerated, there were two 8-inch x 14-inch locomotive cylinders molded up and placed into the core oven, subsequently cored up and cast the following heat. The result of the heat just enumerated was as follows:

Good castings, pounds	8,940
Bad castings, pounds	60
Remelt, pounds	600
	9,600

Total iron melted, 10,186 pounds; melting loss, 586 pounds; coke ratio 1 : 8. The entire cost of labor for the two days was $47.10. There are at present six "seniors" and eight "juniors" in my school. It will therefore be seen that the heat was produced by fourteen students. It is pertinent to state that the "freshmen" are an initial expense to the school, yet I have included the entire cost of labor, regardless of the divided employment of the remaining six "freshmen."



ONE OF THE LARGE LADLES

Number of Students.

Twenty students comprise the school at the present time, exclusive of two colored men who work about the yard, cupola, and cleaning department, etc. The twenty pupils are divided into three classes as indicated above. The seniors are producers, the juniors semi-producers, performing the part of the ordinary helpers, and participate in the ramming and drawing of patterns. The freshmen go through the regular routine of lining up ladles, charging the cupola, the core room, following up the two classes which have preceded them.

The entire force of students are from time to time given diagrammatical instruction, and examples to work out, and are expected to go over these matters during the evening, and bring their report in the morning, whether right or wrong. They do this readily and are anxious to learn.

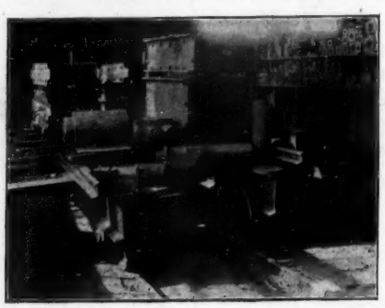
Rubbing beds for marble works being our specialty in loam work, are executed by the juniors and freshmen. The green sand is kept for the seniors. Dry sand work is of secondary importance to them, though they make all locomotive and hoisting engine cylinders in dry sand.

Sole plates weighing 3,500 pounds each are made in dry sand by the juniors and freshmen, dried over night and cast next day. Two juniors and two freshmen make one sole plate per day. The same number of men make one rubbing plate in four days, the weight being 9½ tons.

The items enumerated in the above heat are only a part of the variety of work performed, and while the percentage of loss in the heat given is very small, it is seldom higher at any time. Only when a junior is promoted to the senior grade does the percentage of loss go up temporarily.

Tuition.

The pupils of this school, unlike others, are paid to attend. The present rate of wages ranges from 40 cents to $2.00 a day. The rate of pay increases in proportion to the earning power of the student regardless of the time he has served. The ages of the present students range from 12 years to 31. Their age has also nothing to do with their pay and advancement. For instance, one young man of 16 years now receives $1.50 a day, a man of 31 gets $1.25. Both have been recently promoted to the senior class. In advancing their wages, when the rate reaches $1.00 per day, 10 per cent of this is charged the student for instruction thereafter. This, however, is not applicable in every case, thus the man of 31, who has a family, will advance before he is charged for instruction. The school is now over a year in existence and doing very well.



CORE BUGGY

Security Prices Make General Advance

Despite the general weakness that continued in bonds, an encouraging advance in prices has been shown by stocks during the past week. This advance is attributed to the belief that the vast sums to be distributed at the semi-annual dividend disbursements in July will find their way back into securities for investment. Though buyers were few, sellers were also in small number and there was plenty of the former to take care of all the security offerings. The inference is made from this fact that if any further notable fall in prices is to come, it must be brought about by a liquidation of securities held for investment. Professionals, who have been seeking to depress the market, have, in fact, appeared as buyers for a rise and this influence is believed to have had its effect in helping to bring about higher prices during the week. The bond market remains extremely sluggish and it sustained a further setback on Friday of the past week when the $29,000,000 issue of the city of New York was subscribed only to the extent of 7½ per cent of the total amount. The financial situation developed during the week the end of a gold export movement in which the United States has parted with $25,000,000. The natural expectation of the end of the half year was shown in the hardening of call money and the culmination of the movement was reached on Friday at 10 per cent. Sixty day loans averaged 4½ per cent, against 4¼ per cent last week and 4½ per cent the corresponding week in 1906. The New York bank statement showed a further reduction in the excess reserve which was cut $3,117,325 to the small surplus reserve of $2,500,275, compared with $12,055,750 June 30, 1906. The total cash decrease was about $6,850,000, but the reserve requirement was reduced $3,370,000 by the withdrawal of $14,950,300 in deposits. Loans were contracted $7,813,700. Iron and steel stocks generally were included in the week's market rise. United States Steel securities all advanced; the common 3⅝ points, the preferred 2 points and the bonds ⅜ point. Sales were 192,500 shares common and 19,800 shares preferred. The New York stock exchange trading showed 2,656,400 shares during the week, against 1,226,910 shares last week and 6,026,600 shares the corresponding week in 1906. Exclusive of government bonds, sales of these securities aggregated $4,635,000, against $3,682,000 last week and $7,608,000 in the same week of 1906.

Copper Stocks.

Boston.—Butte Coalition, closed 25, net gain 2; Calumet & Arizona, closed 166, net gain 10; Calumet & Hecla Mining, closed 805; Greene-Cananea, closed 16¼, net gain ¾; Quincy Mining, closed 116, net gain 4.

New York.—Amalgamated Copper closed 86, net gain 4¾.

Financial Notes.

It is estimated that the total semi-annual dividend and interest disbursements to be paid in July will be over $185,000,000. This is the largest amount ever paid out in July. Dividend payments so far declared amount to $82,959,043 and interest payments for the month amount to $95,279,443.

Recent dividend declarations include the following: American Screw Co. regular quarterly dividend of 2½ per cent, payable June 29; Chicago Pneumatic Tool Co. regular quarterly dividend of 1 per cent, payable July 25; American Sewing Machine Co. regular quarterly dividends of 1½ per cent on its preferred stock and 1 per cent on its common stock, payable July 15; American Brake Shoe & Foundry Co. regular quarterly dividends of 1 per cent on the common stock and 1¾ per cent on the preferred stock, payable June 29; Alabama Steel & Ship Building Co. regular semi-annual dividend of 3 per cent, payable July 1; American Locomotive Co. regular quarterly dividends of 1¾ per cent on the preferred stock, payable July 22, and 1¼ per cent on the common stock, payable Aug. 26; Tennessee Coal, Iron & Railroad Co. regular quarterly dividend of 1 per cent on the common stock and 2 per cent on the preferred stock, payable Aug. 1.

THE LEADING INDUSTRIAL SECURITIES.

	Clos'ng Quo. June 29	Changes in Week	Date 1907 Ann. M't'g	Stock Outstanding	Dividend Basis	Dividend Last Paid	Dividend Date Last Div. Pay
Allis-Chalmers	10⅛	+ ⅜	Sept.	19,820,000		.....	.....
Allis-Chalmers pr	29⅞	+2⅜		16,150,000	7 cum	.....	Feb., 1904
American Can	5⅛	+ ⅜	Feb.	41,233,300		.....	.....
Am. Can pr	54¼	+ ⅛		41,233,300	7 cum	5 Q.	Apr., 1907
Am. Car and Fdy	43	+1¾	June 27	30,000,000		2 Q.	Apr., 1907
Am. Car and Fdy pr	98	− ⅛		30,000,000	7 n. c.	7 Q.	Apr., 1907
American Loc.	58⅞	+2⅜	Oct. 5	25,000,000		1¼ Q.	May, 1907
American Loc. pr	105	.....		24,100,000	7 cum	1¾ Q.	Apr., 1907
American Ship	77¾	.....	Oct. 2	7,600,000	6	1 Q.	June, 1907
American Ship pr	105	.....		7,900,000	7 n. c.	1¾ Q.	Jan., 1907
Am. Steel Foundries	7½	+ ⅛	Oct. 1	15,810,000		.....	.....
Am. Steel Foundries pr	37¼	+ ⅜		17,240,000	6 cum	.....	Aug., 1904
Barney & Smith	65	.....	June 4	2,000,000	4	1 Q.	June, 1907
Barney & Smith pr	128⅛	.....		2,500,000	8 cum	2 Q.	June, 1907
Bethlehem Steel	11	.....	April 2	14,862,000		.....	.....
Bethlehem Steel pr	40	.....		14,908,000	7 n. c.	1¾ Q.	May, 1907
Cambria Steel	37¾	+1¼	March 19	45,000,000*	6	3 Q.	Feb., 1907
Cambria Iron	47¼	.....		8,468,000*	4	4 S. A.	Apr., 1907
Chicago Pneumatic Tool	41	.....	Feb. 18	6,145,800	4	4 Q.	Apr., 1907
Colorado Fuel	32	+2¾	Oct. 21	30,132,000		.....	Apr., 1902
Crucible Steel	7¾	− ⅛	Oct. 16	24,578,400		.....	.....
Crucible Steel pr	63	−4¼		24,436,500	7 cum	6	Mar., 1907
Empire Steel	9	.....	Feb. 27	2,281,400		.....	.....
Empire Steel pr	60	.....		2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	100	.....	Feb. 19	1,000,000	6	1¾ Q.	May, 1907
Fay & Egan pr	128⅛	.....		1,000,000	7 cum	1¾ Q.	May, 1907
General Electric	139½	+3	May 14	63,643,600	8	8 Q.	Apr., 1907
Harbison-Walker	11	.....	Jan. 21	18,000,000	6	.....	.....
Harbison-Walker pr	73	.....		9,600,000	6 cum	6 Q.	Jan., 1907
International Pump	24	+1¾	June 4	17,702,500		2	Apr., 1905
International Pump pr	72	+3¾		11,350,000	6 cum	6 Q.	May, 1907
Lackawanna Steel	50	.....	March 13	34,971,400		.....	.....
Lake Sup. Corp.	8⅛	+ ⅛	Oct. 2	40,000,000		.....	.....
New York Air Brake	104½	+3⅜	June 18	10,000,000	8	8 Q.	Apr., 1907
Niles-Bement-Pond	130	.....	Feb. 6	5,000,000	6	6 Q.	Mar., 1907
Niles-Bement-Pond pr	105	.....		2,000,000	6 cum	2 Q.	May, 1907
Otis Elevator Co.	35	.....	March 18	6,350,300		3 A.	Apr., 1907
Otis Elevator Co. pr	87	.....		6,308,500	6 n. c.	6 Q.	Apr., 1907
Penn. Steel	60	.....	May 13	10,750,000		.....	.....
Penn. Steel pr	100	.....		18,500,000	7 n. c.	3½ S. A.	May, 1907
Pittsburg Coal Co	11	− ¾	Feb. 11	32,000,000		.....	Nov., 1906
Pittsburg Coal pr	51⅝	+1⅜		32,000,000	7	.....	Apr., 1905
Pressed Stl. Car	35¼	+3	Feb. 20	12,500,000		3	Aug., 1904
Pressed Stl. Car pr	88⅛	.....		12,500,000	7 n. c.	1¾ Q.	May 1907
Pullman	160	+1¾	Oct. 17	100,000,000	8	2 Q.	May, 1907
Railway Stl. Spring	42¼	+1	March 7	13,500,000		4 S. A.	Mar., 1907
Railway Stl. Spring pr	89½	.....		13,500,000	7 cum	1¾ Q.	June, 1907
Rep. Iron & Steel	27	+1⅜	Oct. 9	27,191,000		.....	.....
Rep. Iron & Steel pr	82½	+1		20,416,100	7 cum	1¾ Q.	July, 1907
Sloss-Sheffield	57	+1	March 5	10,000,000	5	5 Q.	June, 1907
Sloss-Sheffield pr	92½	.....		6,700,000	7 n. c.	1¾ Q.	July, 1907
Tenn. Coal & Iron	140½	+ ½	May 7	22,553,060	4	4 Q.	May, 1907
U. S. Pipe & Fdy	35	+1	June 26	12,500,000	4	1 Q.	June, 1907
U. S. Pipe & Fdy. pr	79½	−1½		12,500,000	7 n. c.	1¾ Q.	June 1907
U. S. Steel	35⅞	+3⅝	April 15	508,302,500	2 n. c.	½ Q.	July, 1907
U. S. Steel pr	99¼	+2		360,281,100	7 cum	1¾ Q.	June, 1907
U. S. Steel 5's	95¾	+ ¾		463,798,000	5	5 A.	.....
Va. Iron, Coal & Coke	65	+4	Sept. 17	8,641,600		.....	.....
Westinghouse Elec	145	+1	July 24	24,988,700*	10	10 Q.	Apr., 1907
Westinghouse Air Brake	148	+1	Oct. 1	11,000,000*		22½ Q.	Jan., 1907

Par value of shares, $100, except those starred (*), $50.

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Southern Motor Car Co., Houston, Tex., has been incorporated with a capital of $60,000 by E. E. Parsons, J. H. Bate, E. M. Pavey and others.

The United Appliance Co., St. Louis, has been organized with a capitalization of $50,000 by William F. Lawrenz, Edward Flannigain and Henry J. Hubert.

The Stearns Co., Erie, Pa., machinery, has been incorporated with a capital of $150,000 by F. F. Curtze, H. C. Schacht, John Walton, A. Weiss and Fred McBrier.

The Lees-Williams Co., Pittsburg, iron and steel, has been formed with a capital of $5,000 by George E. Lees, Daniel Lees, McKeesport, and Harold E. Williams, Pittsburg.

With a capital of $45,000 the Werner Chain & Iron Co., Lebanon, Pa., has been organized by E. A. Werner, Asa Werner, and George E. Molly, all of the above address.

The Frisco Car & Engine Co., St. Louis, capital $100,000, has been chartered to manufacture and repair cars and other railroad equipment. The incorporators are: G. L. Ball, E. A. Haid and E. B. Garnett.

Articles of incorporation have been filed by the Cincinnati Chuck Co., Cincinnati, O., with a capital of $30,000. Those interested are: Philip Fosdick, Richard LeBlond, B. Kern, C. F. Kern, and W. H. Burtner.

The Otto Adams Brass Co., New York, capital $10,000, has been formed to manufacture metal goods by Louis B. London and Joseph Lederer, 381 Broome street; Otto Adams, 79 East 130th street, all of the above address.

The Boynton Co., Waterloo, Ia., capital $100,000, has been organized with J. F. Boynton, president; M. E. Boynton, vice president, and M. J. Krezek, secretary and treasurer. The company will manufacture furnaces, scales, pumps, blowers, etc.

The Long Island Wire Works, Brooklyn, N. Y., capital $15,000, has been organized to manufacture hardware and hardware supplies by James A. King and Wallace King, 82 Schmerhorn street; Joseph Weis and Agnes Weis, 451 Harmon street, all of Brooklyn.

The Parsons Engineering Co., Philadelphia, Pa., has been incorporated under the laws of Delaware with a capital stock of $5,000,000. The incorporators are: John H. Parsons and Theodore C. Search, of Philadelphia, and Herbert H. Ward, of Wilmington, Del.

The Independent Metal Strap Co., New York, capital $10,000, has been chartered by Joseph Shapera and Isaac Shapera, 62 West 119th street; George H. Rosenthal, 280 Broadway, all of the address given above. The company will engage in the manufacture of metal straps and iron and steel products.

With an authorized capital of $50,000 the New York Concrete Wall Machine Co., Buffalo, N. Y., has been formed to manufacture and operate machinery and tools for building with concrete. The incorporators are: Samuel B. Simpkins, Harvey W. Pulnam and Samuel A. Williams, all of Buffalo.

Sexaner & Lemke, Queens, N. Y., have been incorporated to manufacture architectural and ornamental iron work with a capital of $40,000. Those interested are: Ernest Sexaner, 226 Broadway, Flushing, N. Y.; William E. Lemke, 221 South Parsons avenue, Flushing, N. Y.; and Henry Kuntz, Iselin, N. J.

Articles of incorporation have been filed by the United Gas Engine Builders, New York, with a capital of $5,000. Those interested are: Francis H. Stillman, New York; Frank P. Conrad, Newburgh, N. Y.; Thomas J. Barber, Syracuse, N. Y.; John G. Erd, Saginaw, Mich.; James E. Baldwin, Brooklyn, N. Y.; and William J. Graham, Rochester, N. Y.

New Construction:—

The Boston Gear Works, Norfolk Downs, Mass., is erecting a one-story machine shop addition, 40 x 130 feet.

A machine shop and boiler house, three stories, of brick, 67 x 127 feet, is being erected for the John P. Squire Co., Somerville, Mass.

The Bridgeport Chain Co., Bridgeport, Conn., has awarded the contract to the H. M. Purdy Co., of that city, for a three-story brick and concrete mill, 42 x 140 feet.

The cornerstone of the new malleable iron and chain company, Tiffin, O., was laid June 21 with an elaborate ceremony. The plant is a branch of the Webster Mfg. Co., Chicago, and was secured by the liberal subscriptions of Tiffin citizens.

The Reliance Boiler Works, Oshkosh, Wis., which recently suffered a loss from fire, reports that it will rebuild only the damaged portion, a frame building, 36 x 40 feet, iron clad. The four motors which were damaged have been repaired.

The Terre Haute Malleable & Mfg. Co., Terre Haute, Ind., manufacturer of malleable iron castings and hardware specialties, will begin work at an early date on the new foundry which it will erect. The building will be 82 x 270 feet and will include a 12-ton melting furnace.

The Philips Pressed Steel Pulley Works, Fourth street and Glenwood avenue, Philadelphia, proposes to increase its plant for the manufacture of pressed steel pulleys. The initial increase contemplates the manufacture of 500 pulleys per day with an ultimate capacity of double that quantity.

The Sterritt-Thomas Foundry Co., Pittsburg, is having plans drawn for a foundry building, 90 x 180 feet, to replace that portion of its plant recently destroyed by fire. The building will be of steel and concrete and will include a pattern storage shop of slow-burning construction, 48 x 120 feet.

The Monarch Motor Car Co., 403 Monadnock block, Chicago, has had plans prepared for a plant to be built at Arnold and Sixteenth street, Chicago Heights, Ill. There will be three buildings, each one story, 60 x 150 feet; an office building, two stories, 30 x 60 feet, and a power house, one story, 50 x 50 feet, all of reinforced concrete construction.

The Montour Steel Co., Montour Falls, N. Y., which was recently incorporated, will engage in business as contracting engineer and manufacturer of steel construction for bridges, buildings, etc. Construction work has been started on the company's power plant and bridge shop, and it is the intention of the concern to have sufficient machinery installed to begin operations about July 15. The power and equipment have been contracted for. James Towart, of Montour Falls, is president.

The Hoopeston Malleable Iron Works, Hoopeston, Ill., recently organized, is arranging to manufacture malleable iron castings. The company is now erecting a main building, 110 x 250 feet, a second structure, 80 x 150, in addition to small buildings for various purposes. The equipment will include air furnaces and annealing ovens and the usual foundry equipment used in a plant of this kind. The officers of the company are: S. D. Porter, president; Minnie Porter, vice president, and J. A. Scanland, secretary and treasurer.

General Industrial Notes:—

The Columbus Machine Co., Columbus, O., has increased its capital from $112,000 to $150,000.

The new plant of the United States Cast Iron Pipe & Foundry Co., Scottdale, Pa., was placed in operation June 28.

The A. E. Shorhill Co., Marshalltown, Ia., has authorized an increase in its capitalization to $250,000, divided into $50,000 preferred and $200,000 common stock.

The plant of the Robinson Machine Co., Monongahela, Pa., has been sold at receiver's sale for $52,000 to S. R. Wilson, of Pittsburg. It is likely that the plant, which has been idle for some time, will again be operated.

The Hill Clutch Co., Cleveland, has about doubled its facilities for the manufacture of its line of shafting, pulleys and other power transmitting devices by putting in operation a new machine shop and a modern 30-ton foundry.

The Central Machine & Metal Co., Moline, Ill., recently incorporated, will manufacture special and general engines and machinery dies, tools, and stampings. Branch offices have been established at 54 Schmidt building, Davenport, Ia., and at 101 Lake street, Chicago. W. W. Turner is manager of the company.

The M. T. Davidson Co., Brooklyn, N. Y., for which a charter was recently granted in that city, is merely a corporation of M. T. Davidson, manufacturer of steam pumps and hydraulic machinery, 43-53 Keap street, Brooklyn. A number of employes who have been with the firm a long time have been taken into the company. No change in the business is contemplated.

The Columbus Bridge & Iron Co., Columbus, O., has purchased from the American Plate & Boiler Co., a large building located on Parsons avenue near the T. & O. C. railroad, and is having it remodeled and refitted into a structural steel plant. The necessary machinery has already been purchased. Oscar C. Hearing, William H. Renck, and William A. Painter are interested in the company.

The General Pipe & Foundry Co., Atlanta, Ga., a new incorporation, has been formed to take over the business of the American Pipe Bending & Machine Co., manufacturer of pipe bends, steam drums, lap pipe joints, rolled steel and gun iron flanges. In addition to the regular lines the company will add cast iron pipe and fittings from 4 to 16 inches inclusive. All the additional equipment has been purchased.

The Cutler-Hammer Co., Milwaukee, has purchased the Carpeles trunk factory, a five-story brick building with 70,000 square feet of floor space adjoining its plant. This is now being rapidly fitted for the company's use. The Cutler-Hammer Co. now owns a square block of factory buildings in Milwaukee, and has recently acquired another tract of 175 feet on St. Paul avenue, directly across from its plant, which it will hold for future use.

The Cleveland Tumbling Barrel & Mfg. Co., Cleveland, is arranging for the manufacture of tumbling barrels and the making of chaplets. Its machine shop is equipped with a 30-inch lathe, 30-inch planer, a 4-foot radial drill press, clearing five feet from base to top of spindle, in addition to a small drill press, punch, power hack saw and blacksmith forge and other tools. All machine shop work that can be handled by this plant will be taken by the company. The firm is located at East Sixty-fifth street and Erie railroad, occupying a building 30 x 50 feet, with plenty of space adjoining for additional construction when necessary.

The United Iron Works Co., Springfield, Mo., has acquired the Freeman Foundry & Mfg. Works, Joplin, Mo., and will continue to operate the plant along the same lines as formerly. J. W. Freeman's connection with the plant will continue in the capacity of superintendent, and no material changes in respect to the erection of additional buildings at this time or in the operation of the plant, are in contemplation. The United Iron Works Co. now controls seven iron plants in that vicinity, including two at Springfield, Mo.; Aurora, Mo.; Joplin, Mo.; Iola, Kan.; Pittsburg, Kan.; and Cherryvale, Kan. Its officers are: C. H. Cole, president; H. T. Hornsby, vice president and general manager; A. C. Daily, treasurer; and R. P. Bowyer, secretary.

Trade Notes:—

The San Francisco office of the Jones & Laughlin Steel Co. has been moved to a permanent location at 708-709 Crocker building.

R. Hoe & Co., New York, have added a new foundry to their plant which is served by three 10-ton electric overhead traveling cranes with a span of 55 feet. A Newten cupola will be used. Both cranes and cupola were made and supplied by the Northern Engineering Works, Detroit.

In order to handle its business in electric generators and motors in southern Ohio, the Cleveland branch of the Crocker-Wheeler Co., Ampere, N. J., has found it advisable to open an office in the Columbus Savings & Trust Co. building, Columbus, O. The sub-office will be in charge of Charles W. Cross, formerly of the Cleveland office.

The General Engineering Co., 764 South Swanson street, Philadelphia, has just completed a large contract for the McEwen Milk Co., 1515 North Twenty-sixth street, in that city, overhauling the refrigeration plant and installing a 50 horsepower engine and one of the Gemmell patent boilers with smoke stack and all connections complete. This is the first of the Gemmell patent boilers to be installed in Philadelphia.

The Terry Steam Turbine Co., Hartford, Conn., has just secured an order for eight 300 horsepower steam turbines for the new Waterside plant of the New York Edison Co., Thirty-ninth street and First avenue, New York. These turbines are to be used direct connected to centrifugal pumps and are for boiler feed purposes. The capacity of each turbine pump unit will be 1,000 gallons per minute, against a pressure of 300 pounds. The New York Edison Co. has had in use for a year three of the Terry turbines connected to centrifugal pumps for boiler feed purposes.

Fires:—

The plant of the American Engineering & Foundry Co., Los Angeles, Cal., was heavily damaged by fire June 15.

The Buffalo Crucible Casting Co., Buffalo, suffered a loss of about $5,000 from a fire at its plant June 17.

The foundry of the Mitchell & Van Meter Co., Pottstown, Pa., sustained a loss of about $2,000 from fire recently.

The plant of the Ferguson & Lange Foundry Co., Chicago, was damaged to the extent of about $10,000 by fire June 22.

The machine shops and supply house of the De Queen & Eastern railroad, De Queen, Ark., were destroyed June 18 with a loss of about $150,000.

The boiler department of the plant of the Thomas Carlin Sons' Co., Allegheny, Pa., underwent a severe damage by fire recently, causing a loss estimated at $10,000.

ALMOST DOUBLED

Has Capital of Canadian Industries in Past Five Years.—Dominion News.

(Special Correspondence.)

Toronto, July 1.—The latest of the series of Canadian census bulletins respecting manufactures, gives the amounts of capital invested in manufacturing industries in 1900 and 1905, showing for all branches an increase from $446,916,487 to $843,931,178. The figures relating to the leading iron and steel industry are as follow:

	1900.	1905.
Smelting	$10,483,112	$87,482,829
Foundry and machine shop products	16,274,645	30,351,498
Agricultural implements.	18,207,342	28,409,806
Iron and steel products.	9,829,560	9,071,938
Boilers and engines....	5,552,862	4,648,058
Electrical apparatus and supplies	5,267,397	14,393,666
Plumbing and tinsmithing	4,468,296	8,532,203
Iron and steel bridges..	1,755,379	3,341,754
Axes and tools.....	1,169,607	3,672,675
Cars and car works....	2,475,602	14,248,654
Wire	1,599,118	3,981,192

The report of the board of directors of the Dominion Iron & Steel Co. has been issued in advance of the annual meeting to be held July 5, covering operations of the year ended May 31. A synopsis of the trouble over the coal contract with the Dominion Coal Co. is given. In preparing the financial statement the excess cost of coal over the contract price of $1.28 per ton, amounting to $810,713 has been charged to a special account against the coal company as part of the damages claimed from it. On this basis the annual earnings were $2,247,536, interest charges $684,384, and net earnings $1,563,151. Of this, $810,713 was transferred to contingent account to offset the amount charged to the Dominion Coal Co. leaving $752,437 available, out of which after covering some liabilities and deficits a credit balance remained of $318,711. The increased volume of business and the policy of providing reserve stocks of pig iron and billets for the open-hearth furnaces and mills, account for an increase of liquid assets of $447,863. Current liabilities were a little higher, but the net indebtedness was $192,221 less than the previous year. During the year, $306,355 was spent on capital account, the chief items being the Bessemer plant, extension and equipment of coke ovens and ore yard, and development and exploration at Wabana.

Peter McMichael, manager of the Dominion Radiator Co., Toronto, was tried here on June 26 on the charge of violating the provisions of the criminal code relating to agreements unduly in restraint of trade. The defendant had signed an agreement with the Master Plumbers' and Steamfitters' Association in May, 1903, to the effect that the company would not sell goods to the general public and would not sell to the trade outside of the association except at an advance of 20 per cent upon the prices charged to the members of the combine. Subsequently in October, 1904, a still more stringent agreement on the same lines was entered into. The court found that the agreements were in violation of the law and imposed a fine of $250.

A petition has been filed for the winding up J. M. Ross Sons & Co., who, in 1902, commenced the manufacture of engines and threshers in St. Catharines on a nominal capital of $229,000 and a $20,000 bonus from the city. The plant is mortgaged and large judgments are held against the concern.

J. & J. Taylor, safe manufacturers, Toronto, have completed a large addition to their factory.

The General Engineering & Construction Co., Ltd., Toronto, has been incorporated with an authorized capital of $100,000 by Francis D. Mackay, Frank B. Allen, David J. Johnston and others.

FOREIGN TRADE OPPORTUNITIES.

(These inquiries from prospective foreign purchasers are furnished by American consuls to the Government Bureau of Manufactures, Department of Commerce and Labor. Those in which the addresses are omitted are on file at the Bureau of Manufactures, Washington, D. C. In applying for addresses refer to the file number.)

No. 1101. Boiler plates.—An eighteen months' supply of steel plates for boilers is wanted at Toulon. Information from the "Bureau de la Direction des Constructions Navales, Toulon, France."

No. 1106. Farm and industrial machinery.—A native merchant at Cawnpore, India, where there is a model farm to teach the handling and working of modern implements, is prepared to undertake the introduction of American agricultural and manufacturing machinery suitable to the wants of the country, and will be pleased to correspond with manufacturers of such in the United States.

No. 1122. Iron work.—A considerable amount of iron work, including "tabliers metalliques," is wanted in connection with the improvement of the "Canal du Nord." Information from Mon. Barbet, Ingenieur en Chef de Ponts et Chaussees, 44 rue d'Ile, Saint Quentin (Nord), France.

No. 1143. Wood-working and nail machines.—A German firm advises an American consular officer that he wishes to obtain the agency of trustworthy American houses manufacturing wood-working and nail machines. The party in question believes that he can do a large business in these articles.

No. 1152. Locomotives.—The Government Railways at Berlin, Germany, contemplate the purchase of 700 locomotives.

No. 1153. Railway construction.—(1) The Swedish government plans an extension on the railways from Morjarb to Laptrask, at a cost of about $250,000. (2) The Public Works Department at Berlin, Germany, contemplates the construction of a narrow-gage railway near Bremenhaven, at an estimated cost of $486,640. (3) The Italian Government railways are also in the market for luggage vans; communications should be sent to Rome.

No. 1164. Railway equipment. According to the Affarsvarlden, the Swedish Riksdag has passed a resolution to grant eleven million kroner (about $3,000,000) for the commencement of the North Swedish inland railway. The construction of the line will begin at Ostersund, in the province of Jamtland, and continue northwards.

TRADE PUBLICATIONS

Reinforced Concrete.—The General Fireproofing Co., Youngstown, Ohio. Catalog A-63. 32 pages. 6½ x 10¼ inches. This catalog presents illustrations for the General Fireproofing Co.'s system of pin connected girder frames for reinforced concrete construction. It presents numerous illustrations of actual installations and line drawings showing the method of construction. In addition, it gives a report of metallographical work on cold twisted lug bars made for this company by Dr. Henry C. Boynton.

Electrical Appliances.—The General Electric Co., Schenectady, N. Y., has issued a series of bulletins covering the Thomson single phase high torque induction wattmeters, lightning arresters, 1907 types, electrically operated ratchet driven rheostat switches, commutating pole railway motors and General Electric knife blade lever switches. Of the Thomson induction wattmeter, three forms are made, one for house installation, and two for switchboard use. The bulletin presents a number of connection diagrams and dimension drawings to facilitate selection and installation. The ratchet driven rheostat switches are operated by a single pole, double throw knife switch on the switchboard. The switch arm is mounted on the axle of a wheel with a knurled rim and rotated by means of pawls which engage the rim of the wheel. A core actuated by two solenoids moves the pawls to the right or left, depending on which solenoid is energized, the solenoid being connected directly to the double throw knife switch on the switchboard. The bulletin devoted to knife blade lever switches illustrates several forms of this line of switches and contains 16 tables of capacities, catalog numbers, dimensions, prices and other data of interest to the constructing engineer and manufacturer.

Heating Furnaces.—The Rockwell Engineering Co., 26 Cortlandt St., New York, is distributing two bulletins illustrating the Rockwell rod heating furnace and the Rockwell bolt heating furnace. These furnaces are for use with either oil or gas fuel, and are built in a number of varying sizes.

Oil Engines.—The International Oil Engine Co., New York. 10 x 7 inches. 32 pages. This catalog is devoted to a description of the two-cycle oil engine, which is adapted for various uses, including general power purposes, pumping, hoisting and marine work.